

Iowa Broadband

Current Market Analysis & Initial Recommendations For Acceleration of Iowa's Broadband Market

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Executive Summary

This assessment of the broadband market in Iowa is conducted by Connect Iowa in partnership with the Iowa Utilities Board as part of the State Broadband Data and Development grant program (SBDD) funded by the National Telecommunications and Information Administration (NTIA). This report aims to provide a detailed review of the current state of broadband in Iowa that will spark discussion across multiple broadband stakeholders in the state on key goals and strategies to expand and enhance the broadband experience for all Iowans.

The SBDD grant program was created by the Broadband Data Improvement Act (BDIA), unanimously passed by Congress in 2008, and funded by the American Recovery and Reinvestment Act (ARRA) in 2009. As part of the SBDD grant program, in May 2010, Connect Iowa produced a map of broadband availability to identify served and unserved areas across the state. Additionally, Connect Iowa undertook survey research in the spring of 2010 to understand broadband demand trends across the state. The purpose of this research is to better understand the drivers and barriers to technology and broadband adoption and estimate the “Broadband Adoption Gap” across the state of Iowa. Appendix A of this report presents extensive results of this research.

The demand-side survey data complements the mapping inventory information describing the state of broadband supply in Iowa. This report analyzes this complementary demand- and supply-side research and contrasts the data with national benchmarks released by the Federal Communications Commission (FCC) as part of the National Broadband Plan (NBP).¹ Following the spirit of the NBP and based on the broadband availability and adoption data collected by Connect Iowa, this report proposes a series of recommendations to spur discussion and feedback among key stakeholders across Iowa. To account for feedback to this report, Connect Iowa will facilitate listening sessions across the state and will gather feedback through multiple other means to ensure all voices are heard and included. This process will ensure a fully informed Broadband Action Plan to be released in 2011.

Overview of the Broadband Market in Iowa

The Connect Iowa survey data shows that as of April 2010, approximately two-thirds (66%) of Iowa residents have a broadband connection in the home, which implies an adoption gap for the state of Iowa of 34% of households, in line with the national adoption gap measured by the FCC.² On the supply side, according to Connect Iowa broadband inventory estimates, 95.36% of all Iowa households have terrestrial, fixed broadband service available at the basic speeds of 768 Kbps download/200 Kbps upload, and 99.37% of households have fixed or mobile broadband service available at this basic level.³ This implies that approximately 30% of Iowa households have basic broadband available but, for various reasons, are choosing not to subscribe to the service in their home. Of the 34% of Iowans without a home broadband connection, 45% report a lack of interest in broadband, 31% report a lack of a computer as the primary barrier to broadband, 21% say broadband is too expensive, and 10% report lack of broadband availability at their home.

Connect Iowa survey data also show that 19% of Iowa residents do not own a home computer. This translates to more than 431,000 adults without a home computer, with more than two-thirds of those without a computer saying they do not believe they need one.

FCC national data indicate that non-adopters are generally senior citizens, members of ethnic minorities, rural dwellers, people with disabilities, people of low income, and/or people with less education.⁴ These data are largely

¹ Broadband is defined according to current NTIA definition of at least 768 Kbps download and 200 Kbps upload speeds.

² *Broadband Adoption and Use in America: OBI Working Paper Series No. 1*, J. Horrigan, Federal Communications Commission, February 2010.

³ *The Broadband Availability Gap: OBI Technical Paper No. 1*, Federal Communications Commission, April 2010.

⁴ *Broadband Adoption and Use in America: OBI Working Paper Series No. 1*, J. Horrigan, Federal Communications Commission, February 2010.

in line with estimated adoption rates by these same demographic groups in the state of Iowa, with the exception of rural Iowans. While the statewide average broadband adoption rate is 66%, broadband adoption rates in Iowa are: 54% for adults with disabilities; 33% among adults age 65 and older; 40% among households with annual incomes below \$25,000; 59% among low-income households with children; and 58% among minority households. Interestingly, broadband adoption among rural residents in Iowa is not significantly lower than their urban or suburban counterparts. This is in marked contrast with FCC national estimates of home broadband adoption among rural residents (of 50%) and non-rural areas (where home broadband adoption is estimated at 68%). Unlike national trends, the Iowa adoption gap is not a rural versus non-rural phenomenon.

In terms of broadband availability, it is estimated that as of May 2010, terrestrial, fixed broadband providers offer service to 95.36% of all Iowa households.⁵ This implies that an estimated 53,000 Iowa households (4.64%) lack basic broadband service and remain unserved by terrestrial, fixed broadband. It is further estimated that approximately 87.60% of Iowa households have broadband available at download speeds of 3 Mbps or more. This implies that an estimated 89,000 Iowa households (7.76%) have basic broadband available but lack fixed broadband service of at least 3 Mbps downstream – a service level now often considered necessary for effectively conducting many Internet applications. The NTIA classifies broadband service at download speeds below 3 Mbps as “under-served.” Taking into account mobile broadband service platforms in addition to terrestrial fixed service, an estimated 99.37% of Iowa households had broadband available in May 2010 from at least one provider at download speeds of 768 Kbps or higher. An estimated 96.94% of Iowa households had broadband available at 3-6 Mbps download speeds from at least one terrestrial fixed or mobile provider. The percent of Iowa households with fixed or mobile broadband available at a minimum of 6 Mbps download speed drops to 77.27%.

However, statewide estimates do not necessarily reflect the reality faced by each Iowa community. Connect Iowa county-level availability estimates reveal large variances in measured broadband inventory across counties, highlighting the importance of granular data in order to identify gaps in infrastructure and adoption at the community level. County-level as well as more granular, street level broadband inventory data is available through Connect Iowa’s interactive, online broadband inventory map at <http://connectiowa.org>.

Significant variance in broadband availability across rural and non-rural counties is measured at different speed tiers. Further, penetration at the county level by different broadband platforms similarly varies greatly (for example, fixed wireless penetration in rural counties varies from 0% in Van Buren County, to 99.89% of households served in Pocahontas County). The disparity of the broadband market across counties suggests that ongoing investment in broadband capacity is affected by local factors. Understanding these local dynamics is essential to developing pragmatic solutions tailored to the broadband challenges facing each community.

This report also examines the impact of three key components of the federal Universal Service Fund (USF) program (High Cost Loop Support, Local Switching Support, and Interstate Line Sharing Support) across Iowa counties, and contrasts data pertaining to these programs with estimates of broadband availability. Results reveal that county-level eligibility for these USF programs partially explains broadband penetration across rural counties in Iowa. Hence, the FCC Universal Service Fund reforms currently underway are likely to have important implications across the state. Further examination of the impact of comprehensive USF disbursements across Iowa communities is recommended in order to assess the historical and ongoing impact of this federal program upon the broadband market in Iowa and evaluate the implications of proposed reforms.

Connect Iowa’s broadband availability estimates are compared to county-level availability estimates derived in the FCC study “The Broadband Availability Gap,” part of the NBP.⁶ This study informs the national debate over

⁵ *The Broadband Availability Gap: OBI Technical Paper No. 1*, Federal Communications Commission, April 2010.

⁶ Ibid.

Universal Service Fund reform currently led by the FCC. Connect Iowa estimates that only 87.60% of Iowa households have broadband available at download speeds of 3 Mbps or more. By contrast, the FCC estimates that nationwide, approximately 95% of households have broadband available at download speeds of 4 Mbps or more. A county-level comparison of the two studies reveals significant disparities in broadband availability estimates, particularly in counties with lower population density.

Disparities between the Connect Iowa broadband inventory and the FCC Availability Gap simulation for the state of Iowa may result from unique structural factors of the broadband market in the state of Iowa. It is important to continue gathering and validating broadband inventory and adoption data in the state of Iowa – particularly in rural areas – in order to accurately measure the broadband gaps across the state and inform the ongoing Universal Service Fund reform debate currently underway at the FCC.

Policy Considerations

The FCC's National Broadband Plan (NBP) recommends a series of strategies to ensure that broadband is more affordable and accessible to all Americans. The NBP recommends a holistic approach to address the availability and adoption gaps by tackling key barriers to adoption including relevance, affordability, digital literacy, and availability. The holistic approach includes programs aimed to encourage adoption in the home, as well as the strengthening of public computing and Internet access capacity at community anchor institutions (schools, libraries, etc.). This approach is consistent with the programs that Congress unanimously mandated in the BDIA. The NBP and BDIA call for a series of principles and programs to be implemented at the federal, state, and local levels for achieving pragmatic solutions to the broadband availability and adoption gaps. Key among these are the following recommendations and programs particularly relevant to the state of Iowa and its communities.

Strategies To Address the Broadband Availability Gap

- Conduct further analysis of the impact of Universal Service Fund & Intercarrier Compensation Rules Reform upon communities across Iowa. As stated above, data suggest that the USF program has had significant impact across the state. Further research and analysis of FCC data and proposals is recommended to better understand the impact of proposed reforms.
- Encourage coordination at the state and local level aimed to achieve economies of scale and promote efficiency of public investments, including comprehensive planning for broadband in infrastructure projects; joint deployment of broadband conduit alongside state financed or enabled infrastructure projects; establishment of "Gigabit Communities" or "Broadband Corridors" in regions in the state; assessing the possibility of developing a set of state master contracts to expedite the placement of wireless towers on state government property and buildings.
- Facilitate further expansion of mobile 3G and 4G networks by streamlining local and state rules and regulations affecting the cost and build-out speed of towers supporting these networks.
- Encourage development of statewide "smart grids" that leverage the state's broadband infrastructure, making Iowa a more efficient producer and consumer of energy.
- Promote lower costs of access to key network inputs such as utility-owned poles, ducts, conduits, and rights-of-way.
- Leverage the opportunities potentially available under the extended SBDD grant program to promote public-private partnerships to address existing gaps in the network at the local level.
- Continue efforts to measure and map broadband inventory data. The May 2010 Connect Iowa estimates of broadband inventory and mapping is a first-of-its-kind tool that enables a clearer picture of the challeng-

es and opportunities for broadband expansion in Iowa. This report summarizes the results of this research at the county level, and concludes that when it comes to broadband, one-size-fits-all does not apply. It is not enough to evaluate statewide trends and broadband inventory. Granular data at the county-level and beyond is necessary to accurately measure the challenges on the ground and develop sound, pragmatic policy to address them. Hence, continued efforts to collect, validate, and benchmark broadband supply and demand data across the state is recommended.

Strategies To Address the Broadband Adoption Use Gap

- Promote and facilitate local community engagement aimed to address local barriers to adoption and develop pragmatic solutions tailored to each community.
- Promote public-private partnerships at the state and local levels to build education and awareness campaigns focused on the benefits of broadband technology among at-risk populations. Awareness campaigns should target at-risk populations and address the concrete and pragmatic benefits that broadband technology can afford every community, neighborhood, school, library, community center, and household. Leverage the potential opportunity under the extended SBDD grant program to conduct statewide broadband awareness campaigns and local, grassroots broadband adoption stimulation strategies.
- Expand, improve, or create pragmatic digital literacy programs at the state and local level and leverage digital literacy resources available via the NBP proposed National Digital Literacy Program. The extended SBDD grant program application includes a proposal to fund a comprehensive statewide implementation of the Connected Corps program that will partner with Iowa universities and community colleges to recruit college students as technology ambassadors for their communities while simultaneously creating local jobs for students.
- Encourage public-private collaboration to educate consumers and families about the reality of online risks and promote online safety practices among children and citizens. Work with not-for-profits promoting online safety practices and encourage online safety practices and principles across various state departments and among educators in the state of Iowa. If funded, leverage the extended SBDD grant program's statewide broadband awareness campaign strategies.
- Leverage the proposed federal National Broadband Clearinghouse portal aimed to promote best practices and information sharing, as well as the federal Online Digital Literacy Portal program.
- Promote expansion of publicly available computing and online resources leveraging federal, state, local, and private funds. Optimize access to federal resources available through programs such as the USF Schools and Libraries (E-Rate) and Rural Health Care support programs as well as public funding available through the federal Institute of Museum and Library Services (IMLS).
- Monitor and assess how the proposed reform of the Low Income Support programs under the Universal Service Fund will affect Iowans.
- Coordinate with Iowa tribal nations on broadband issues. The NBP recognizes the importance of working with tribal nations to develop programs tailored to address the particular technology adoption challenges faced by these communities.

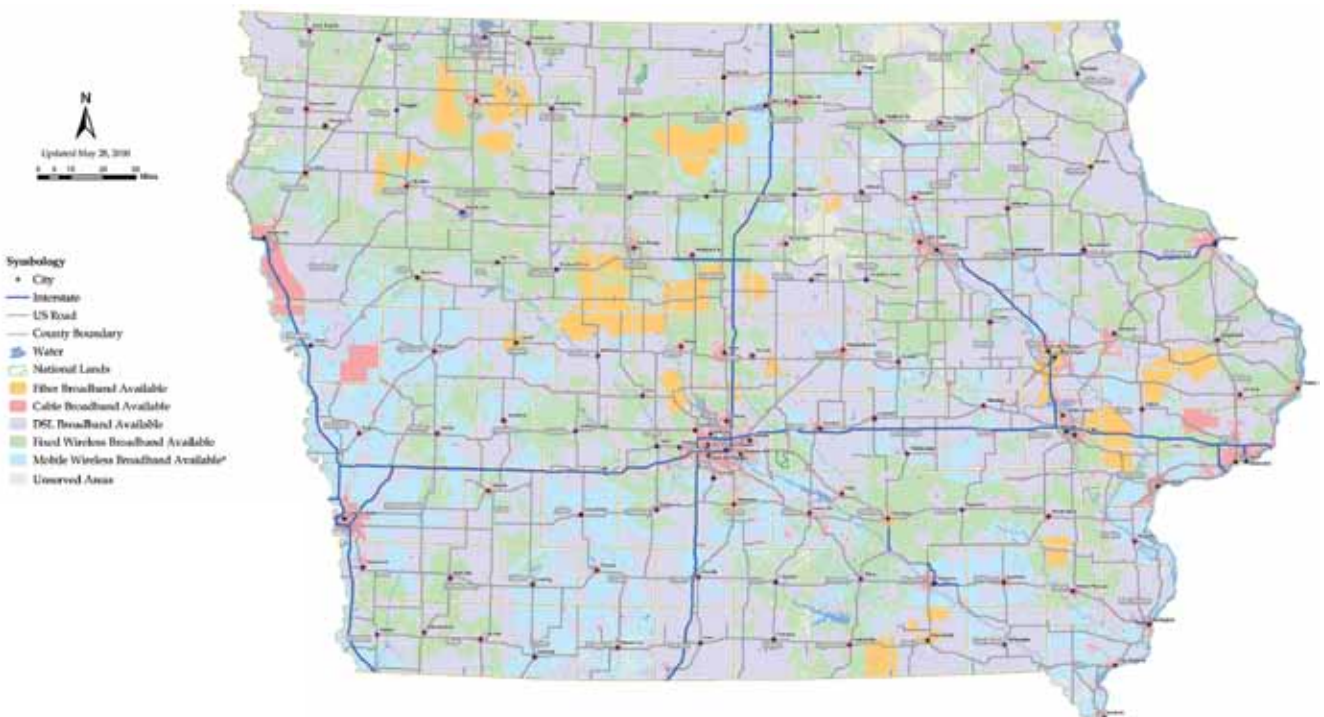
1 Introduction

Connect Iowa is working in partnership with the Iowa Utilities Board to implement the State Broadband Data and Development grant program (SBDD) in the state. The SBDD grant program was created by the Broadband Data Improvement Act (BDIA), unanimously passed by Congress in 2008 and funded by the American Recovery and Reinvestment Act (ARRA) in 2009.⁷ The original SBDD grant program included two key components as defined in the Notice of Funds Availability (NOFA) released by the National Telecommunications and Information Administration, U.S. Department of Commerce, in 2009: the Broadband Mapping and Planning Programs.⁸

In May 2010, Connect Iowa produced a map of the inventory of broadband availability across the state. The purpose of this program is to collect comprehensive data from all broadband providers to create an inventory of the broadband infrastructure across the state. A key goal of the mapping exercise is to identify communities and households that remain unserved or underserved by broadband service; information that is essential to estimate the “Broadband Availability Gap” and understand the scope and scale of providing universal broadband service to all citizens across the state. The May 2010 Connect Iowa Broadband Inventory Map is the first comprehensive inventory of broadband infrastructure in the state. The inventory will be updated twice yearly with the upcoming submission scheduled for the fall of 2010.

The below map has been included for illustration purposes only. An interactive version is available at http://connectiowa.org/mapping/interactive_map.php.

Broadband Service Inventory for the State of Iowa



⁷ Broadband Data Improvement Act, P.L. 110-385, (“BDIA”).

⁸ State Broadband and Development Grant Program Notice of Funds Availability, NTIA, U.S. Department of Commerce, July 9, 2009. (“SBDD NOFA”). Available at http://www.ntia.doc.gov/frnotices/2009/FR_BBNOFA_090709.pdf

The Planning program complements and builds upon this Mapping program. To complement the broadband inventory and mapping data, Connect Iowa has undertaken survey research to understand broadband demand trends across the state. In the spring of 2010, Connect Iowa surveyed a sample of 1,201 adults across the state to inquire about their current use of broadband and related technologies. The purpose of this research is to better understand the drivers and barriers to technology and broadband adoption and estimate the “Broadband Adoption Gap” across the state of Iowa. Key questions the data address are: Which citizens are using broadband technology across the state of Iowa? How and where are they using it across the state? How is this technology impacting Iowa households and citizens? And, importantly, who is not adopting broadband service and why? What are the barriers that still prevent citizens from embracing this empowering technology?

The demand-side survey data and the mapping inventory describing the state of broadband supply in Iowa afford the first-of-its-kind comprehensive review of the state of broadband in Iowa. Based on these data, this report aims to provide a detailed review of the current state of broadband in Iowa that will spark discussion across multiple broadband stakeholders in the state on key policy goals and strategies to expand and enhance the broadband experience for all Iowans. The report should be understood as a beginning, and not an end, for a comprehensive review of matters affecting the broadband market in the state.

To this goal the report analyzes this complementary demand- and supply-side research and contrasts the data with national benchmarks released by the Federal Communications Commission (FCC) as part of the National Broadband Plan.⁹

The state of Iowa potentially has the opportunity for further federal resources under the SBDD grant program expansion of mid-2010 that would complement the Mapping and Planning SBDD grants awarded in 2009. In partnership with the Iowa Utilities Board, Connect Iowa submitted in July an extended application for federal funds under the SBDD grant program 2.0. This application requests funding to finance a series of complementary programs including: expanded broadband inventory and demand-side data collection; state broadband capacity building that will coordinate and facilitate strategies to implement pragmatic policies for broadband expansion; technical assistance program that will complement and add to existing resources for broadband expansion; local and regional technology planning teams that will leverage statewide resources, tools and best practices in order to facilitate local pragmatic solutions to address the broadband availability and adoption challenges faced by each community across Iowa.

This report is structured as follows: Section 2 provides a summary overview of the estimated broadband availability and adoption gaps across the state of Iowa. Based on these data, the section summarizes policy recommendations inspired by the principles and vision of the FCC’s NBP as they apply to the state of Iowa. Section 3 provides a detailed analysis of the broadband availability gap across the state. This section presents an analysis of the SBDD broadband inventory data and compares and contrasts estimated broadband inventory in Iowa with national benchmarks. Finally, Appendix A of this report includes the Connect Iowa Technology Assessment, June 2010, providing detailed results from Connect Iowa’s spring 2010 residential survey research.

⁹ *Connecting America: The National Broadband Plan*, Federal Communications Commission, April 2010. (“National Broadband Plan” or “NBP”). Available at <http://www.broadband.gov/plan/>

2 The State of the Broadband Market in Iowa – Policy Recommendations

This section provides a summary overview of the estimated broadband availability and adoption gaps across the state of Iowa. This overview is based on Connect Iowa’s extensive broadband inventory data, analyzed in detail in Section 3, and survey research data, described in detail in Appendix A. Based on this data, the section summarizes a series of policy recommendations inspired by the principles and vision of the FCC’s NBP as they apply to the state of Iowa.

The overview and recommendations of this section are based on data and policy recommendations from three key sources:

- The National Broadband Plan: The NBP presents a series of studies analyzing the state of broadband across the USA. These data are used as a benchmark against which we compare data collected in the state of Iowa. Furthermore, the NBP provides a series of goals and recommendations that are evaluated in this section in light of the state of broadband in the state of Iowa. This section outlines policy recommendations that are particularly relevant to the state of Iowa, given the current state of broadband inventory and usage among consumers, businesses, and various key sectors.
- The Iowa Utilities Board’s report titled “Assessing High-Speed Internet Access in the State of Iowa: Sixth Assessment.”¹⁰
- The Connect Iowa broadband inventory and survey research funded under the SBDD mapping grant.

The National Broadband Plan is over 350 pages long and offers a broad set of recommendations directed at more than 20 federal agencies as well as state and local government. In order to synthesize the key elements of these recommendations that are most relevant to the state of Iowa, this section focuses on two key “gap” areas: the broadband availability gap and the broadband adoption and digital skills gap.

2.1 The Broadband Availability Gap

Table 1 reports summary statistics of the estimated fixed, terrestrial broadband availability inventory across the state of Iowa. The table presents the number and percentage of unserved and served households by fixed broadband by speed tiers. Speed tiers are based on the definitions provided by the NTIA’s rules for the implementation of the SBDD grant program.¹¹ Table 1 is based on data from all terrestrial, non-mobile platforms, including cable, DSL, fiber, and fixed wireless, but excluding households served by mobile or satellite broadband. While the NTIA definition of unserved areas encompasses all broadband platforms, including mobile wireless networks, Table 1 focuses only on fixed, terrestrial broadband infrastructure and excludes mobile and satellite service territory.¹² Table 2, below, presents served and unserved household data by all terrestrial broadband platforms, including mobile.

¹⁰ *Assessing High-Speed Internet Access in the State of Iowa: Sixth Assessment, A Report of the Iowa Utilities Board*, January 2008, (“IUB Sixth Assessment”). Available at http://www.state.ia.us/government/com/util/docs/reports/InternetAccess_2008.pdf

¹¹ Speed tiers are based on the tiers defined by the NTIA in the SBDD NOFA, Technical Appendix.

¹² “*Unserved area* means a proposed funded service area, composed of one or more contiguous Census Blocks, where at least 90 percent of households in the proposed funded service area lack access to facilities-based, terrestrial broadband service, either fixed or mobile, at the minimum broadband transmission speed (set forth in the definition of broadband above). A household has access to broadband service if the household can readily subscribe to that service upon request.” SBDD NOFA Section III Page 32549

Table 1 – Estimate Of Broadband Service Availability In The State Of Iowa –
By Speed Tier Among Fixed Platforms

SBDD Download Speed Tiers	Unserved Households (000s)	Served Households (000s)	Percent Households By Speed Tier
At Least 768-1500 Kbps	53	1,096	95.36%
At Least 1.5-3 Mbps	93	1,056	91.90%
At Least 3-6 Mbps	142	1,007	87.60%
At Least 6-10 Mbps	261	888	77.27%
At Least 10-25 Mbps	299	850	73.98%
At Least 25-50 Mbps	979	170	14.80%
At Least 50-100 Mbps	1,013	136	11.82%
At Least 100-1000 Mbps	1,109	40	3.49%
At Least 1 Gbps	1,137	13	1.10%

Source: Connect Iowa, May 2010.

The total number of households in Iowa in 2000 was 1,149,276 for a total population of 2,926,324.¹³ In May 2010 it is estimated that terrestrial, fixed broadband was available to 95.36% of all Iowa households.¹⁴ This implies that an estimate of 53,000 Iowa households or 4.64% remain unserved by a fixed broadband provider. Further, 87.6% of households across Iowa have terrestrial, fixed broadband available at 3-6 Mbps download speeds or above. This implies that an estimated 89,000 or 7.76% of households across Iowa have fixed broadband service available but at download speeds below 3 Mbps, or speeds of broadband service that the NTIA classifies as *underserved*.¹⁵

Further, 77.27% of Iowan households have broadband service available at 6-10 Mbps download speed capacity; and 73.98% have broadband available of at least 10-25 Mbps download speed capacity. Investment in speeds higher than 25 Mbps appears to be lagging across Iowa with only 14.80% of households having broadband access available above this speed. A similar percentage, 11.82%, have broadband available above 50 Mbps; 3.49% above 100 Mbps and 1.10% above 1Gbps download speeds.

Table 2 summarizes estimates of broadband availability in Iowa across all types of terrestrial platforms, including mobile wireless platforms. In May 2010 facilities-based mobile broadband providers in Iowa served an estimated 90.56% of all households.¹⁶

¹³ National Census, 2000. U.S.Census Bureau.

¹⁴ Broadband is defined according to the current NTIA definition as 768 Kbps download and 200 Kbps upload speeds.

¹⁵ "Underserved area means a proposed funded service area, composed of one or more contiguous Census Blocks meeting certain criteria that measure the availability of broadband service and the level of advertised broadband speeds. [...] Specifically, a proposed funded service area may qualify as underserved for last mile projects if at least one of the following factors is met, though the presumption will be that more than one factor is present: 1. No more than 50 percent of the households in the proposed funded service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband transmission speed (set forth in the definition of broadband above); 2. No fixed or mobile broadband service provider advertises broadband transmission speeds of at least three megabits per second ("mbps") downstream in the proposed funded service area; or 3. The rate of broadband subscription for the proposed funded service area is 40 percent of households or less."

SBDD NOFA Section III Page 32549

¹⁶ Note that this measure of broadband availability is based on households passed, not geography served. Further, consumers may experience lower availability of mobile broadband service since typically each consumer has access to only one mobile broadband provider. Hence, existence of mobile broadband service by one provider does not necessarily imply that all mobile subscribers have access at that location. Only subscribers to the mobile services available within that location will experience reception.

Taking into account both fixed and mobile broadband service platforms, an estimated 99.37% of Iowa households had broadband available from at least one provider at download speeds of 768 Kbps or higher. This implies that 0.63% of households remain unserved by a terrestrial broadband connection (including mobile). Additionally, an estimated 96.94% of all households had broadband available from at least one terrestrial platform, including mobile, of 3-6 Mbps download speeds and 77.27% of Iowa households had broadband available at 6 Mbps download speeds or higher.

**Table 2 – Estimate of Broadband Service Availability in the State of Iowa –
By Speed Tier – All Terrestrial Platforms (Including Mobile)**

SBDD Download Speed Tiers	Unserved Households	Served Household	Percent Households by Tier
At Least 768-1500 Kbps	7,218	1,142,058	99.37%
At Least 1.5-3 Mbps	13,409	1,135,867	98.83%
At Least 3-6 Mbps	35,137	1,114,139	96.94%
6 Mbps or more	261,000	888,000	77.27%

Source: Connect Iowa, May 2010.

However, statewide estimates do not necessarily reflect the reality faced by each community. Section 3.2 analyzes estimated broadband inventory across all Iowa counties. Figures 5 and 6 in that section present estimated number and percentage of households served by terrestrial, non-mobile broadband at speeds of 768 download/200 upload Kbps and above as well as 3 Mbps download speeds or more and including household density by county. The data reveals large variances in measured broadband inventory across counties, highlighting the importance of granular data in order to identify gaps in infrastructure and adoption at the community level. Such information is essential to develop pragmatic policy solutions tailored to the challenges facing each community.

The NBP includes six broad goals addressing broadband expansion across the U.S. that form the basis for the strategies it outlines. The first goal calls for at least 100 million U.S. homes with affordable access to actual download speeds of at least 100 Mbps and actual upload speeds of at least 50 Mbps by 2020. It further establishes an interim milestone goal whereby 100 million homes should have affordable broadband available with actual download speeds of 50 Mbps and actual upload speeds of 20 Mbps by 2015.¹⁷

Goal 2 of the NBP establishes that the U.S. should lead the world in mobile innovation, with the fastest and most extensive wireless network of any nation and establishes recommendations to reach this goal and accelerate deployment of 3G mobile networks where they are lacking, as well as new 4G technology across the country.¹⁸

Goal 3 of the NBP calls for universal affordable access to robust broadband service, and the means and skills for residents to subscribe if they so choose. The NBP also defines a minimum or “floor” capacity for such universal access of 4 Mbps actual download speeds and 1 Mbps actual upload speed capacity. This “floor” speed is the minimum capacity target for the formulation of a new Connect America Fund, designed to substitute the existing Universal Service Fund program (USF) and subsidize the construction of such networks in unserved and under-served areas across America.¹⁹

¹⁷ NBP, p. 9.

¹⁸ Ibid.

¹⁹ NBP, p. 10.

Table 1 indicates that the extent of broadband across Iowa is extensive, with 95.36% of households able to connect at download speeds of at least 768 Kbps. Yet, the data reveals that there is still a gap to fill in order to reach the goals set in the NBP.

Despite private as well as public investment, an estimated 53,000 households remain unserved by any kind of terrestrial fixed broadband, and approximately 90,000 households are served with broadband service offering speeds below 3 Mbps, or speeds classified as “underserved” by the NTIA.²⁰ This estimate of approximately 150,000 unserved or underserved households corresponds to just over 2% of the FCC national estimate of 7 million households with no available broadband service or with service at speeds below the NBP target of 4 Mbps download and 1 Mbps upload speed capacity.²¹ However, given the low density of population in unserved and underserved areas across Iowa, it is likely that providing support to connect underserved and unserved households across Iowa will continue to fall well within the established rules and programs of the Connect America Fund, currently being designed. The average density of households per Census Block that remains unserved across Iowa is 3.66 (households per square mile of land territory). The average density of households per Census Block that remains underserved (with service below 3 Mbps download speeds) across Iowa is 6.52 households per square mile of land territory.²²

Further the May 2010 broadband inventory in Iowa estimates that 88.18% of households do not have broadband service of at least 50 Mbps download speeds, and 96.51% of Iowan households do not have broadband available at download speed of at least 100 Mbps. Finally, the Iowa broadband inventory estimates that 90.56% of Iowan households have access to at least one mobile broadband service provider. This implies that 9.44% of Iowa households do not have mobile broadband service available.

The NBP recommends a series of federal, state, and local measures that aim to encourage further private investment in order to fill these gaps and reach the NBP Goal 1 and 2 targets. We discuss below some of the key recommendations as they apply to the state of Iowa.

2.1.1 Strategies to Close the Availability Gap

- **Universal Service Fund & Intercarrier Compensation Rules Reform**

The NBP calls for a Universal Service Fund (USF) and Intercarrier Compensation (ICC) reform.²³ The NBP and the FCC’s Notice of Inquiry (NOI) regarding the reform of the USF High Cost programs correctly assert that the current federal High Cost USF program, projected to amount to \$4.6 billion in 2010, is established to fund traditional POTS (Plain Old Telephone Services) and not broadband services and states that “[w]hile the High-Cost program has made a material difference in enabling households in many high cost areas of America to have access to affordable voice service, it will not do the same for broadband without reform of the current system.”²⁴ FCC procedures to address these proposed reforms are underway in the form of various NOIs and Notices of Proposed Rulemaking (NPRM) to further understand the complexity of the reform and propose rulemakings.²⁵ Data collected by Connect Iowa presented in this report suggests that federal funding under the current Universal Service Fund program

20 Connect Iowa collected data from providers in order to estimate the statewide broadband inventory using the NTIA speed tiers defined in the SBDD NOFA. There is no speed tier in this classification that corresponds directly to the floor target selected by the NBP of 4 Mbps actual download speeds and 1 Mbps actual upload speed. The closest feasible comparison, therefore, is the NTIA defined tier of at least 3 Mbps to 6 Mbps download speeds.

21 *The Broadband Availability Gap: OBI Technical Paper No. 1*, Federal Communications Commission, April 2010. (“FCC Broadband Availability Gap” or “Broadband Availability Gap”). Available at <http://www.broadband.gov/plan/broadband-working-reports-technical-papers.html>. For a broader discussion of this study and its repercussion, see Section 3 of this report.

22 See Section 3 below for a full discussion of the density of population across served and unserved areas in the state of Iowa.

23 NBP, p.10.

24 NBP, p. 140-142 and Federal Communications Commission, Notice of Inquiry, High-Cost Universal Service Support, WC Docket No. 05-337, April 21, 2010, (“USF NOI”).

25 USF NOI.

explains some of the investment in infrastructure build-out measured (See Section 3 of this report). In light of this, the following considerations should be taken into account as Iowa policymakers contemplate strategies to expand broadband:

2.1.1.i. Further exploring the impact of current USF program across different communities of Iowa – both capital investment and operational subsidies. Section 3 below examines data available in Iowa regarding areas that receive High Cost Loop support under the current USF program. As noted in this report, this data is revealing, yet insufficient to fully assess the impact upon Iowans of the current USF program. It does not, for example, include data regarding the levels of historical funding accruing to various regions and communities for High Cost Loop support; support under other components of the High Cost program; low-income support programs-related subsidies; or disbursements under the e-Rate and Rural Health Care program support. Furthermore, the data do not demonstrate the impact of ICC access rates upon rural broadband investments in Iowa. Because all of these programs are interrelated, it is imperative to further understand how they affect communities across Iowa in order to evaluate the impact of proposed reforms to the USF currently underway. Hence, collection and analysis of further data regarding USF disbursements and infrastructure enabled by these interlocking programs is recommended.

2.1.1.ii. Engaging in the FCC discussion over USF and ICC reform to understand, and where possible measure, the impact upon Iowan communities. In particular, consideration should be given to establishing a dialogue with the FCC to explore the particularities of the Iowa market and contrast them to FCC national assessment of the Availability Gap, which serves as a key benchmark for the USF reform debate. The FCC's Availability Gap study includes a simulation of the broadband infrastructure inventory across the USA. Section 3 of this report compares and contrasts results of this study with the Connect Iowa measured broadband inventory and concludes that the FCC Availability Gap analysis is an insufficient predictor of the state of broadband inventory across Iowa's rural regions. This report addresses some of the key structural factors of the Iowa broadband market that may explain the discrepancy across these two estimates. It is recommended to continue gathering and validating broadband inventory data across Iowa, under the current SBDD program in order to inform the ongoing Universal Service Fund reform debate currently underway at the FCC and assess how it affects the state of Iowa.

- Encourage coordination at the state and local level aimed to achieve economies of scale and encourage efficiency of public investments

According to the NBP, deployment costs for broadband service to unserved areas could drop dramatically through coordination and planning with other infrastructure projects.²⁶ The NBP recommends a series of measures and policies aimed at encouraging this coordination among projects receiving federal funding.²⁷ Many of these measures are applicable to state and local government, including:

- 2.1.1.iii. Plan for broadband in infrastructure projects; for example, consider “dig once” measures and legislation that would apply to all future state funded or enabled projects;
- 2.1.1.iv. Encourage joint deployment of broadband conduit alongside state financed or enabled infrastructure projects such as highway, road, and bridge projects;

²⁶ According to the NBP, placement costs associated with burying fiber or cable on the ground can account for ¾ of the total costs of deployment, which would be partially saved if conducted at the time of road, bridge or development construction. NBP, p. 114.

²⁷ NBP, Chapter 6, p. 109.

- 2.1.1.v. Develop policies aimed to encourage local and state government policies that will deploy broadband conduits to new neighborhoods and developments;
- 2.1.1.vi. Establish “Gigabit Communities” or “Broadband Corridors” in regions within the state by working together with state, local, and private stakeholders;
- 2.1.1.vii. Evaluate local and state rules and regulations that currently affect the cost and speed of towers supporting mobile networks and assess how such measure can be streamlined to encourage faster deployment of 3G networks across the state, and attract faster investment from mobile providers for the rollout of 4G mobile networks;
- 2.1.1.viii. Explore the possibility of developing a set of state master contracts to expedite the placement of wireless towers on state government property and buildings.

- **Encourage development of statewide “smart grids”**

The NBP emphasizes the opportunity to significantly improve national electricity distribution efficiency by developing “smart grids” that leverage our national broadband infrastructure.²⁸ Efforts are underway at the federal level to assess the challenges facing the expansion of “smart grids” across the nation. Iowa, like all other states, has much to gain from these “smart grids” that will maximize benefits to Iowans of the broadband infrastructure and result in more energy efficient communities. “Smart grids” will improve Iowans’ livelihood, benefit the environment, and make Iowa more competitive both nationally and internationally.

- 2.1.1.ix. In order to make Iowa a leader in “smart grid” development, a comprehensive review of the challenges of developing these platforms is recommended. Such review would aim to understand Iowa-specific assets and challenges of the electricity distribution market, develop pragmatic policies that will encourage private sector investment in these networks, assess what role the state should have in coordinating and encouraging cooperation across the broadband and energy sectors in the state, and leverage the programs and opportunities to expand “smart grids” developed at the federal level.

- **Lower costs of access to key network inputs such as utility-owned poles, ducts, conduits, and rights-of-way**

According to the NBP, the cost of deploying a broadband network depends significantly on the costs that service providers incur to access conduits, ducts, poles, and rights-of-way (ROW) on public and private lands. The NBP estimates that up to 20% of a rural subscriber’s broadband bill is due to pole rental costs.²⁹ Further, rearranging existing pole attachments or installing new poles, and “make ready” charges can constitute upwards of 10% of the cost of deployment in rural areas. The market for pole rental presents multiple sets of inconsistent rules, policies, and prices across both public and private lands. Often pole rental pricing and rules present different rates for pole attachments based on the category of service that would be supported by the pole network, not on the cost of the inputs. Such a pricing scheme may result in price disincentives for decisions to expand service or invest in capacity upgrades (such as 4G networks).

According to the NBP, the cost of deployment of and time to market new technologies can be reduced by a series of measures aimed at cutting rental fees and expediting processes and decreasing the risks and complexities that companies face as they deploy broadband network infrastructure.³⁰ With this goal in mind, the NBP recommends a series of measures, including the following practices by the state of Iowa:

²⁸ NBP, p. 249.

²⁹ NBP, p. 109.

³⁰ NBP, p. 110.

- 2.1.1.x. Create a Task Force (or subgroup) of federal, state, local, and tribal ROW experts to catalog ROW policies, identify ROW policies that are consistent and inconsistent with broadband deployment, and recommend guidelines and cost-lowering processes;
- 2.1.1.xi. Conduct research to better understand current state and local pole rental and ROW rules and policies and define strategies to encourage efficiencies in essential input for broadband deployment;
- 2.1.1.xii. Review and reform Rights of Way and Pole Rental Rules over state public lands and assess means to incentivize more efficient local government rules and regulations that may inadvertently encourage excessive ROW and pole rental prices or delays in deployment plans;
- 2.1.1.xiii. Explore and establish state policies aimed to lower the cost of entry in the provision of broadband service;
- 2.1.1.xiv. Explore the possibility of developing a state master contract to expedite placement of wireless towers on state government property and buildings; and
- 2.1.1.xv. Collaborate with the FCC and other Federal agencies in the implementation of similar federal policies where they apply to Iowa.

- **Promote public-private partnerships to address existing gaps in the network at the local level**

Once the gaps in the broadband network are identified at the local level, pragmatic solutions to fill these gaps need to be developed. Statewide stakeholders should work to implement strategies to facilitate pragmatic solutions for broadband build-out to unserved areas.

- 2.1.1.xvi. Strategies that have a proven record of success include local-level public-private partnerships to build new and expanded broadband capacity across unserved areas. Statewide resources should promote and encourage such strategies and ensure that state and federal resources (both financial and technical) are fully leveraged to achieve these goals. If funded, the extended federal SBDD grant program will provide resources across Iowa to develop best practice resources, and technical engineering capacity to encourage and facilitate this kind of local public-private partnerships.

- **Continue efforts to measure and map broadband inventory data**

The May 2010 Connect Iowa estimates of broadband inventory and mapping is a first-of-its-kind tool that enables a clearer picture of the challenges and opportunities for broadband expansion in Iowa. This first estimate reveals that the state of Iowa is on par with national benchmarks of broadband inventory and speeds. It also reveals that, like elsewhere in the country, there is a sizable availability gap that needs to be addressed by sound policy. Further, the data reveals that broadband inventory across the state is not homogenous. Factors including density of population and historical USF funding have an impact on where broadband is available and is not. Other more idiosyncratic factors likely also affect the current state of broadband deployment. It is not enough to evaluate statewide trends and broadband inventory. Granular data at the county level and beyond is necessary to accurately measure the challenges on the ground and develop sound, pragmatic policy to help address them.

- 2.1.1.xvii. Continued efforts to collect, validate, and benchmark broadband inventory data across the state under the SBDD program is recommended. If funded, the extended federal SBDD grant program will provide financial support for three additional years — beyond the two-year Mapping grant program underway — of collection, integration, and verification of broadband inventory data and mapping.

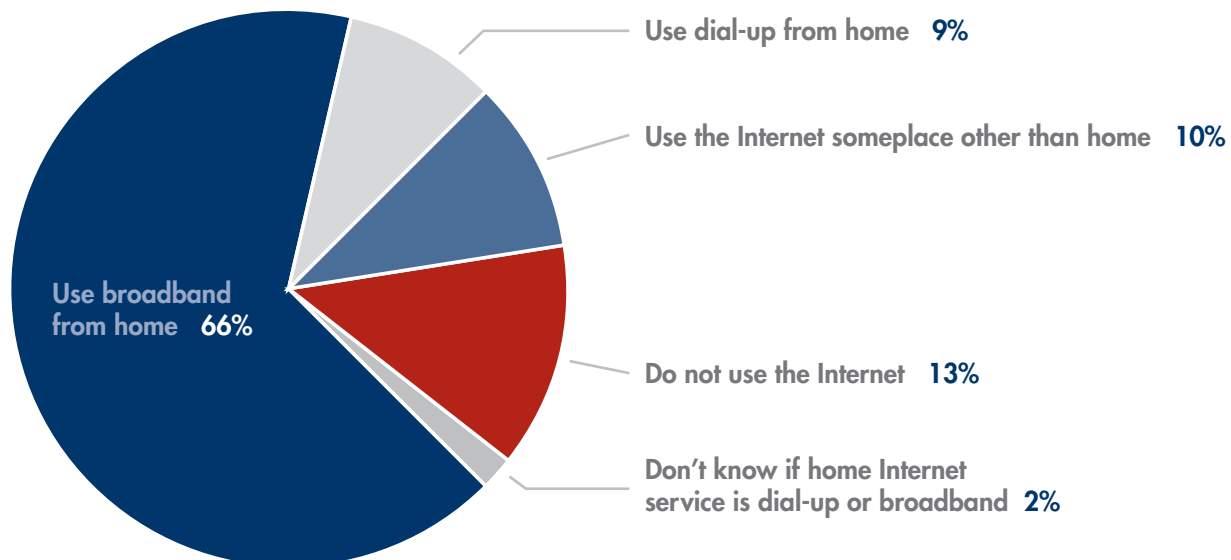
2.2 The Broadband Adoption Gap

As part of the SBDD grant program, Connect Iowa has collected consumer survey data aimed at understanding demand-side trends and barriers in the Iowa broadband market. This section summarizes the main findings of this research, contrasts Iowa trends with available national benchmarks, and discusses policy recommendations that stem from the data and the FCC's NBP policy recommendations.³¹ Appendix A of this report presents the Connect Iowa Residential Technology Assessment, released in June 2010, which includes detailed results of Iowa's consumer survey research.

Approximately one-third (34%) of Iowan residents do not have broadband service in the home, an adoption gap for the state of Iowa similar to the national adoption gap measured by the FCC. The percentage of households across Iowa that have broadband service in the home is 66%; by comparison, national surveys show that 67% of American households subscribe to home broadband service. Statewide, 81% of all residents own a home computer. This translates into over 431,000 adults without a home computer, with more than two-thirds of those without a computer saying they do not believe they need one.

Nine percent of Iowa residents use dial-up service to connect to the Internet and 2% are not certain whether they use broadband or dial-up in the home. Ten percent of adults surveyed report accessing the Internet from places other than the home, for a total of 87% who report accessing the Internet from either the home or someplace else. This contrasts with national estimates of 74% of adult residents who access the Internet from home or somewhere else.³² Across Iowa, 77% of surveyed adults report accessing the Internet from home; 33% from work; and 16% from a library. Eighteen percent of Iowa residents access the Internet via a cell phone or mobile device. Finally, 13% report that they do not use the Internet. (See Figure 1)

Figure 1: Iowa Technology Adoption Summary



³¹ *The Broadband Availability Gap: OBI Technical Paper No. 1*, Federal Communications Commission, April 2010.

³² *Ibid.*

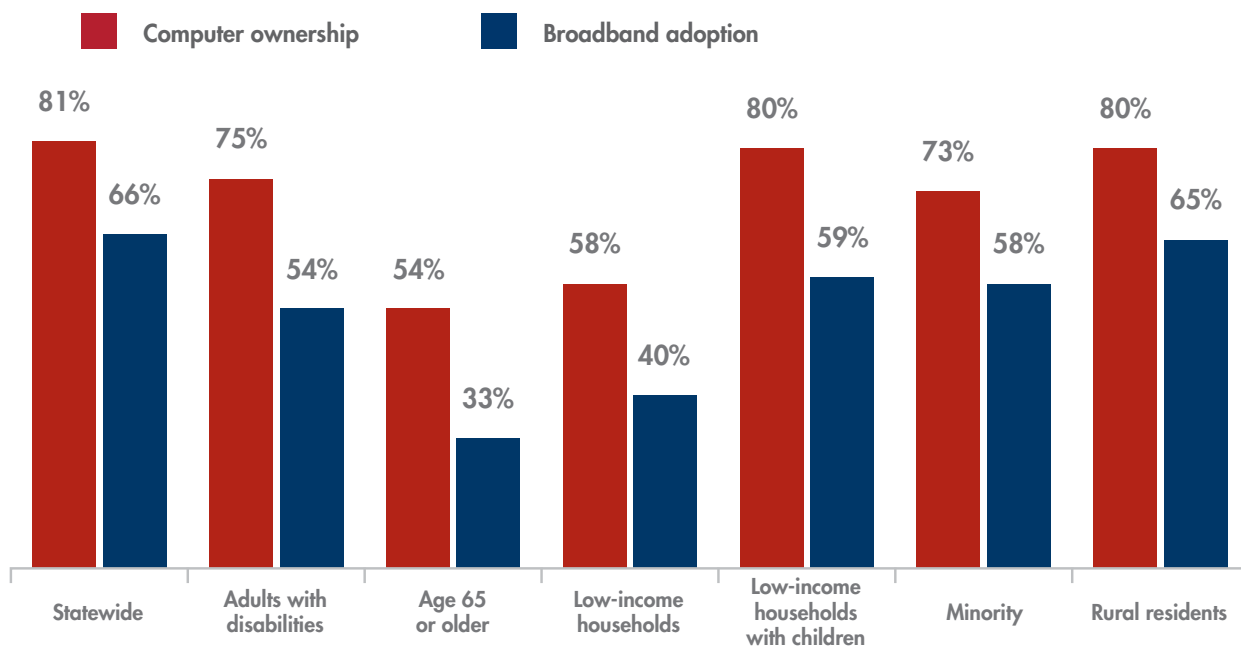
A 66% broadband adoption rate contrasts with the estimates of the broadband availability gap in Iowa presented in this report. According to Connect Iowa broadband inventory estimates, 95.36% of all Iowan households have broadband available (or are served) at the basic speeds of 768 Kbps download/200 Kbps upload.³³ This implies that roughly 30% of Iowan households have broadband available but, for various reasons, are choosing not to subscribe to the service in the home.

This adoption gap is similar to that measured by the FCC at the national level and suggests that when it comes to broadband, the old adage of “build it and they will come” does not always work. The NBP recommends that this adoption gap needs to be tackled at the federal, state, and local level through a series of complementary strategies. The NBP recommends that programs aimed to increase adoption rates for low-income people need to be modernized to support broadband, improve participation in the digital economy and society, and protect against waste, fraud, and abuse.

2.2.1 Broadband Adopters and Non-Adopters

FCC national data indicate that non-adopters are generally senior citizens, members of ethnic minorities, rural dwellers, people with disabilities, people of low income, and/or people with less education.³⁴ These data are largely in line with estimated adoption rates by these demographic groups in the state of Iowa, with the exception of rural Iowans. Figure 2 reports Iowa computer and broadband adoption data across these same demographic groups.³⁵

Figure 2: Iowa Technology Adoption by Demographic



While the statewide average broadband adoption rate is 66%, broadband adoption rates in Iowa are 54% for adults with disabilities; 33% among adults age 65 and older; 40% among households with annual incomes below \$25,000; 59% among low-income households with children; and 58% among minority households.

³³ See Section 3 of this report.

³⁴ See FCC Broadband Adoption and Use, Exhibit 1, p. 13.

³⁵ See Appendix A, Slide 9.

Interestingly, broadband adoption among rural residents in Iowa is not significantly lower than their urban or suburban counterparts. This is in marked contrast with national estimates of home broadband adoption among rural and non-rural areas. According to FCC data, nationally 68% of American adults living in non-rural areas adopt broadband, compared to only 50% of their counterparts living in rural areas.³⁶ The demand-side digital divide across rural and non-rural areas in Iowa is less acute than at the national level. Nonetheless, 35% of rural households in Iowa do not have broadband in the home, an adoption gap on par with the overall national average.

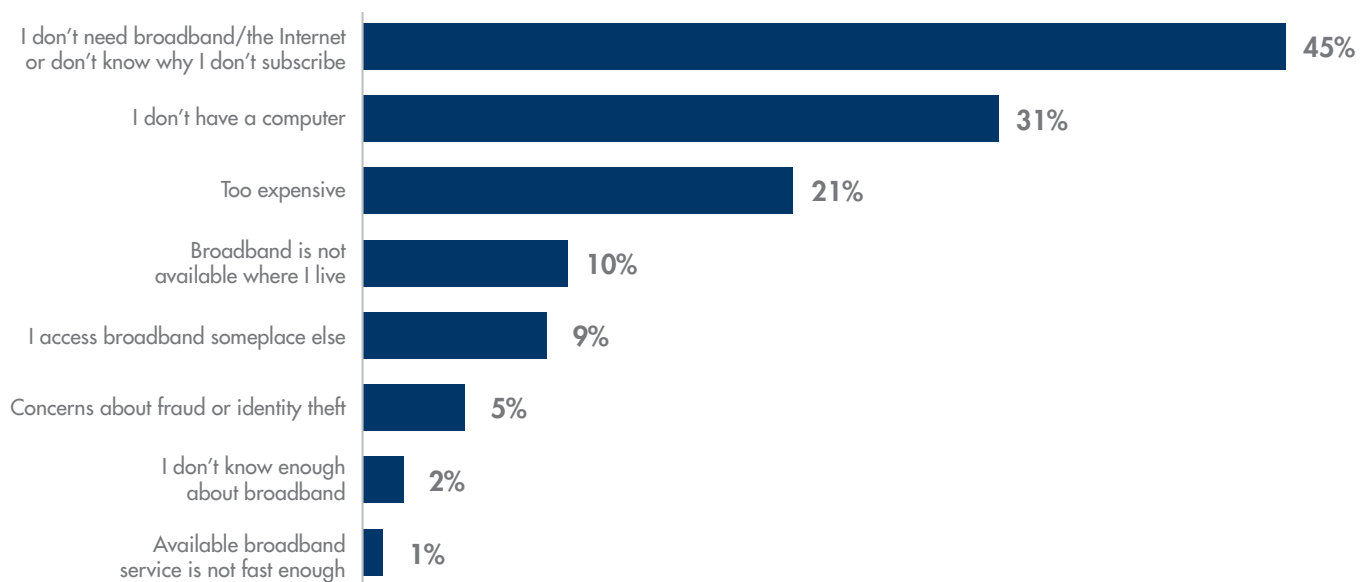
2.2.2 Barriers to Adoption

The FCC Broadband Adoption and Use study indicates that the main reason people do not adopt broadband is cost of the service, with 36% of respondents who do not adopt broadband citing cost as a barrier to adoption. Fifteen percent specifically point to monthly fees for service, 10% say they cannot afford a computer, and 9% cite activation fees and reluctance to enter into long term contracts as a barrier to adoption. Twenty percent of non-adopters cite digital literacy as a barrier to adoption. Twelve percent of respondents cite lack of comfort with computers and 10% cite hazards of online safety. Relevance is the third most commonly cited barrier to adoption. Nineteen percent of non-adopters cite relevance as a barrier. Five percent report that they are content with existing dial-up service or don't need more speed; 5% believe the Internet is a waste of time; 4% report there is nothing they want to see online; and 4% don't use the Internet much. Other reasons measured include use of the Internet at work, with 3% of non-adopters citing this, and lack of broadband availability reported by 5% of non-adopters.³⁷

Figure 3 reports data collected in the state of Iowa, which identifies similar barriers to adoption of broadband technology.

Figure 3: Iowa Barriers to Computer Ownership

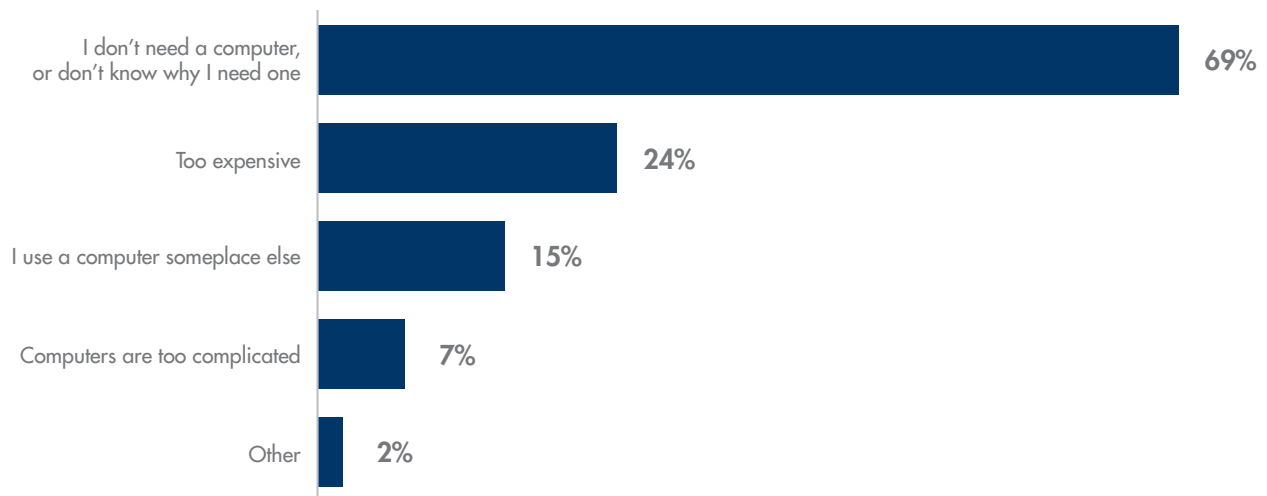
Percent of Iowa residents with no home broadband service



³⁶ *The Broadband Availability Gap: OBI Technical Paper No. 1*, Federal Communications Commission, April 2010.

³⁷ FCC Broadband Adoption and Use.

Figure 4: Iowa Barriers to Computer Ownership
Percent of Iowa residents with no computer at home



The top barriers to adoption among Iowa adults who do not have broadband in the home and those who do not own a computer in the home are:

- **Relevance:** Forty-five percent of Iowa residents who do not have home broadband service say it is because they do not need Internet service or don't understand the benefits it affords. Sixty-nine percent of adults who do not have a computer in the home say they don't need it or don't know what they need a computer for. Among rural non-subscribers, the belief that they do not need broadband or the Internet is still the top barrier to adoption.
- **Computer Ownership:** Thirty-one percent of broadband non-adopters say that the lack of a home computer is a barrier to broadband adoption.
- **Affordability:** Twenty-one percent of broadband non-adopters say broadband is too expensive and 24% of those lacking a computer in the home say it is because computers are too expensive.
- **Availability:** Ten percent of Iowans who do not subscribe to home broadband service report that the lack of available broadband service is a barrier to adoption for them.
- **Other Locations:** Nine percent of non-adopters claim they access the Internet from somewhere else.
- **Digital Literacy and Perceived Online Risks:** Seven percent of non-computer-owners report they don't have one because computers are too complicated. Two percent of non-broadband subscribers say "I don't know enough about broadband" is a barrier. Five percent of dial-up users say they don't upgrade to broadband because they don't know enough about broadband. Five percent of non-adopters report concerns about fraud and identity theft as a barrier to adoption.³⁸

³⁸ See Appendix A.

2.2.3 Broadband Applications and Uses

Broadband is a tool that enables citizens, companies, and government to better communicate, connect, and engage. To better understand how broadband is currently affecting the lives and endeavors of Iowans today, and what opportunities exist to expand the benefits of this technology, survey research conducted by Connect Iowa explores the online applications used by Iowans.³⁹

The top applications used by Iowa Internet users include sending or receiving e-mail, researching and purchasing products or services online, using a search engine, and communicating with friends and family online.

- **E-Health:** Nearly two-thirds of Iowa Internet users (63%) search for health or medical information online, while 29% communicate with their health insurance company and 22% interact with doctors or healthcare professionals online.
- **E-Government Services:** E-government services are utilized by many Iowa Internet users. Forty-five percent report that they search online for information about government services or policies. In addition, 43% conduct online transactions with government offices (such as e-filing taxes or filling out forms), 27% interact with Iowa state government offices, 23% interact with local government offices, and 20% interact with elected officials or candidates online.
- **E-Education:** Many Iowa Internet users go online for educational purposes. Statewide, 44% conduct research for schoolwork online, 37% interact with teachers online, and 21% take classes online. Twenty-four percent of rural Internet users report taking classes online. While rural Internet users are less likely than the state average to communicate with government offices or healthcare providers, they are more likely to conduct research for school and take classes online.
- **E-Jobs:** Iowa residents also use the Internet for work purposes. Among Iowa Internet users, 54% interact with businesses, 48% interact with their co-workers online, 38% go online to search for jobs or employment, and 30% report that they go online to work from home at least occasionally. Further, in Iowa, 14% of employed adults report that they telework. Teleworking could also provide an additional boost to the state's workforce, as one-fifth of retirees, and over one-fourth of adults with disabilities and homemakers say they would likely join the workforce if empowered to do so by teleworking.

2.2.4 Strategies to Close the Adoption Gap

Research suggests that broadband adoption and usage trends among Iowans generally follow the national trends. The Adoption Gap in Iowa is estimated to be similar to the national estimate and non-adopters overwhelmingly include the vulnerable demographics: the elderly, people with disabilities, low-income residents, and minorities.

The adoption gap appears to be smaller among Iowan rural households than among their national counterparts. While the national adoption rate among rural households is 50% (compared to 68% among non-rural households), Iowan rural households adopt broadband at similar rates to the state and national average. This is good news and suggests that rural communities and households across Iowa are more connected than rural communities across other states. However, on a statewide basis, there remains a real and significant adoption gap of 34% of Iowan households. This gap can and should be addressed by pragmatic policy solutions.

Data also suggests that the reasons why Iowans are not choosing or able to embrace 21st century technologies are similar to national trends: relevance, technology inventory, affordability, availability, and digital literacy being among the top barriers to adoption of broadband and related technologies.

³⁹ See Appendix A. For a breakdown of broadband application usage across different vulnerable demographics see slides 48-130.

Finally, Iowans are increasingly using broadband technologies to improve their lives and endeavors. Broadband technology is helping citizens better connect with friends and family; federal, state, and local government; health-related resources; and educational and professional opportunities. Yet, there is further room for growth in application and usage of broadband that can and should be promoted by sound state and local policy.

Having measured similar adoption trends at the national level, the NBP recommends a series of strategies to ensure that broadband is more affordable and accessible to all Americans. The NBP recommends a holistic approach to address the adoption gap among vulnerable populations and tackle key barriers to adoption including relevance, affordability, and digital literacy. The holistic approach includes programs aimed to encourage adoption in the home, as well as the strengthening of public computing and Internet access capacity at community anchor institutions.

This holistic approach is consistent with the programs that Congress unanimously mandated in the BDIA. The NBP and BDIA call for series of principles and programs to be implemented at the federal, state, and local levels aimed to implement pragmatic solutions to the broadband adoption gap. Key among these are the following programs particularly relevant to state and local stakeholders:

- 2.2.4.i Promote public-private partnerships at the state and local levels to build awareness campaigns about the benefits of broadband technology among at-risk populations. Awareness campaigns should target at-risk populations and address the concrete and pragmatic benefits that broadband technology can afford every community, neighborhood, school, library, community center, and household. Leverage the potential opportunity under the extended SBDD grant program to conduct statewide broadband awareness campaigns and local, grassroots broadband adoption stimulation strategies.
- 2.2.4.ii Promote and facilitate local community engagement aimed to address local barriers to adoption and develop pragmatic solutions tailored to each community. The extended SBDD grant program application includes a program for developing local and regional Technology Planning Teams at the county level to leverage the program's technical assistance tools to establish specific technology adoption goals, recommendations, and action plans across community sectors. Statewide resources should be fully leveraged to ensure the success of these grassroots strategies.
- 2.2.4.iii Expand, improve, or create pragmatic digital literacy programs at the state and local level and leverage digital literacy resources available via the NBP proposed National Digital Literacy Program. The extended SBDD grant program application includes a proposal to fund a comprehensive statewide implementation of the Connected Corps program that will partner with Iowa universities and community colleges to recruit college students as technology ambassadors for their communities while simultaneously creating local jobs for students.
- 2.2.4.iv Encourage public-private collaboration to educate consumers and families about the reality of online risks and promote online safety practices among children and citizens. Work with not-for-profits promoting online safety practices and encourage online safety practices and principles across various State Departments and among educators in the state of Iowa.⁴⁰ If funded, leverage the extended SBDD grant program's statewide broadband awareness campaign strategies.
- 2.2.4.v Leverage the proposed federal National Broadband Clearinghouse portal aimed to promote best practices and information sharing, as well as the federal Online Digital Literacy Portal program. Explore ways to leverage these federal online resources to complement and promote new or existing local or

⁴⁰ For best practices regarding online safety strategies see The Children's Partnership, iKeepSafe and the Family Online Safety Institute (FOSI).

state resources – such as the Collaboration site sponsored by the state of Iowa (<http://collaboration.iowa.gov>) – to more efficiently and effectively coordinate and implement best practices models and digital literacy offerings across the state in a manner that is streamlined and non-duplicative of current or proposed assets or offerings.

- 2.2.4.vi Promote expansion of publicly available computing and online resources leveraging federal, state, local, and private funds. Federal resources available through programs such as the USF Schools and Libraries (E-Rate) and Rural Health Care support programs as well as public funding available through the federal Institute of Museum and Library Services (IMLS). Disbursements in Iowa under the e-Rate amounted to just under \$10 million in 2009 and a cumulative amount of \$87 million between 1998 and 2009. Disbursements in Iowa under the Rural Health Care amounted to \$571,000 in 2009 and a cumulative amount of \$2.35 million between 1998 and 2009.⁴¹
- 2.2.4.vii Monitor and assess how the proposed reform of the Low Income Support programs under the Universal Service Fund will affect Iowans. The NBP calls for a comprehensive reform of the USF programs, including programs aimed to support low-income households, including Lifeline and Linkup, and the Federal-State Joint Board on Universal Service is seeking comment on these programs.⁴² In 2009, disbursement of low-income support funds across the state of Iowa amounted to \$4.3 million, mostly from the Lifeline program. Between 1998 and 2009, low-income support disbursements in Iowa amount to \$40.7 million.⁴³ Hence, the reform underway is likely to have a significant impact upon the opportunity of low-income households in the state to bridge the digital divide.
- 2.2.4.viii Coordinate with Iowa tribal nations on broadband issues. The NBP recognizes the importance of working with tribal nations to develop programs tailored to address the particular technology adoption challenges faced by these communities.

⁴¹ *The Broadband Availability Gap: OBI Technical Paper No. 1*, Federal Communications Commission, April 2010.

⁴² Ibid.

⁴³ Ibid.

3 Connect Iowa Broadband Inventory and Analysis – Spring 2010

In May 2010, Connect Iowa, working in partnership with the Iowa Utilities Board, produced a map of the inventory of broadband availability across the state. This mapping exercise was funded by the National Telecommunications and Information Administration, U.S. Department of Commerce, and is in compliance with the rules and requirements of the federal State Broadband and Development Grant Program.⁴⁴ The purpose of this exercise is to measure the level of broadband service available to Iowans and identify communities and households that remain unserved or underserved by broadband service.

The FCC's National Broadband Plan sets six goals that frame the FCC's recommendations for federal, state, and local policy objectives and strategies for the U.S. broadband market. Based on these six goals the NBP offers a series of normative recommendations for policy measures to help spur innovation, investment, and adoption of the broadband service. One key area related to all of these recommendations is the goal of universal availability of broadband infrastructure. The six goals of the NBP are as follows:

- 1) At least 100 million U.S. homes having affordable access to download speeds of at least 100 Mbps and upload speeds of at least 50 Mbps.
- 2) The U.S. should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.
- 3) Every American should have affordable access to robust broadband service of at minimum 4 Mbps download speeds, and the means and skills to subscribe if they so choose.
- 4) Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.
- 5) To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.
- 6) To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

The NBP recommends a series of policy measures that will help achieve these goals across America. In order to understand which of these policy measures are best suited to address the challenges to broadband expansion faced in Iowa, this report first examines how the broadband market in Iowa compares against these national goals set in the NBP.

Results of the Iowa mapping exercise can be found at Connect Iowa's interactive online mapping platform available at http://connectiowa.org/mapping/_interactive_map_interface/?q=map. It is important to note that the inventory of broadband measured in these maps and used to conduct this analysis is preliminary in nature. The Connect Iowa spring 2010 broadband inventory and Broadband Inventory Map are the first of their kind in the state of Iowa. Data collected includes the majority of known broadband providers in the state; however, there are a few broadband providers that were unable or unwilling to participate in this first round of data collection. The maps will be further completed as networks owned by these providers are included in the Iowa broadband mapping inventory updates. Further, the measured broadband inventory provides an estimate of the true extent of broadband coverage across the state. There is a degree of measurement error inherent in this exercise, which needs to be taken into consideration when analyzing the data. This measurement error will decrease as the maps become ac-

44 SBDD NOFA: RIN 0660-ZA29 July 8, 2009

tive tools for local, state, and federal stakeholders, who will be able to identify areas where the displayed coverage is underestimated or overestimated. Connect Iowa welcomes such feedback, to be analyzed in collaboration with broadband providers to correct errors identified in the maps.⁴⁵ The following section summarizes results from these mapping efforts focusing at the state and county levels.

3.1 Broadband Availability in Iowa – A State Bird’s-Eye View

3.1.1 Fixed Broadband Inventory

The total number of households in Iowa in 2000 was 1,149,276 for a total population of 2,926,324.⁴⁶ Table 3 (similar to Table 1) reports estimates of the number and percentages of households across Iowa having broadband available at various download speed tiers.⁴⁷ Table 3 is based on broadband inventory data from all terrestrial, non-mobile platforms, including cable, DSL, fiber, and fixed wireless, but excluding households served by mobile or satellite broadband.

In May 2010 fixed broadband was available to approximately 1.1 million households, or 95.36% of all Iowan households.⁴⁸ This implies that approximately 53,000 Iowa households or 4.64% remain *unserved* by terrestrial, fixed broadband.^{49,50} Further, an estimated one million or 87.6% of households across Iowa have broadband available at 3-6 Mbps download speeds or above. This implies that an estimated 89,000 or 7.76% of households across Iowa have fixed broadband service available at download speeds below 3 Mbps, or speeds that the NTIA classifies as *underserved*.⁵¹ The percentage of Iowa households having fixed broadband access available of at least 6-10 Mbps download speeds is estimated at 77.27%. The percentage having fixed broadband available at least 10-25 Mbps is estimated at 73.98%. Investment in speeds higher than 25 Mbps appears to be lagging across Iowa with only an estimate of 14.80% of households having fixed broadband access available above this speed; 11.82% of households have broadband available above 50 Mbps; 3.49% above 100 Mbps and 1.10% above 1Gbps download speeds.

45 *The Broadband Availability Gap: OBI Technical Paper No. 1*, Federal Communications Commission, April 2010.

46 National Census, 2000, U.S. Census Bureau.

47 Speed tiers are based on the tiers defined by the NTIA in the SBDD NOFA.

48 Broadband is defined according to current NTIA and FCC definition, or 768 Kbps download and 200 Kbps upload speeds.

49 “*Unserved area* means a proposed funded service area, composed of one or more contiguous Census Blocks, where at least 90 percent of households in the proposed funded service area lack access to facilities-based, terrestrial broadband service, either fixed or mobile, at the minimum broadband transmission speed (set forth in the definition of broadband above). A household has access to broadband service if the household can readily subscribe to that service upon request.” SBDD NOFA Section III Page 32549

50 While the NTIA definition of “unserved” and “underserved” areas encompasses all broadband platforms, including mobile wireless networks, Table 3 focuses only on fixed, terrestrial broadband infrastructure. Table 8 includes data across all terrestrial platforms.

51 “*Underserved area* means a proposed funded service area, composed of one or more contiguous Census Blocks meeting certain criteria that measure the availability of broadband service and the level of advertised broadband speeds. [...] Specifically, a proposed funded service area may qualify as underserved for last mile projects if at least one of the following factors is met, though the presumption will be that more than one factor is present: 1. No more than 50 percent of the households in the proposed funded service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband transmission speed (set forth in the definition of broadband above); 2. No fixed or mobile broadband service provider advertises broadband transmission speeds of at least three megabits per second (“mbps”) downstream in the proposed funded service area; or 3. The rate of broadband subscribership for the proposed funded service area is 40 percent of households or less.” SBDD NOFA Section III Page 32549

**Table 3 – Availability Estimate of Broadband Service in the State of Iowa –
By Speed Tier Among Fixed Platforms**

SBDD Download Speed Tiers	Unserved Households (000s)	Served Households (000s)	Percent Households By Speed Tier
At Least 768-1500 Kbps	53	1,096	95.36%
At Least 1.5-3 Mbps	93	1,056	91.90%
At Least 3-6 Mbps	142	1,007	87.60%
At Least 6-10 Mbps	261	888	77.27%
At Least 10-25 Mbps	299	850	73.98%
At Least 25-50 Mbps	979	170	14.80%
At Least 50-100 Mbps	1,013	136	11.82%
At Least 100-1000 Mbps	1,109	40	3.49%
At Least 1 Gbps	1,137	13	1.10%

Source: Connect Iowa, May 2010.

While there is no national benchmark of broadband available at this time (the SBDD program will generate a national broadband map that will provide such reference), measures obtained by Connected Nation, (Connect Iowa's parent company) across 11 other states plus Puerto Rico suggests that broadband investment in Iowa is on par with that of other states similar to Iowa which are highly rural. Table 4 reports data collected by Connected Nation in the winter and spring of 2010 in the following states: Alaska, Florida, Iowa, Illinois, Kansas, Michigan, Minnesota, Nevada, Ohio, Puerto Rico, South Carolina, Tennessee, and Texas.⁵² Following the NTIA definition of broadband, this measure of broadband availability includes any connection providing service of at least 768 Kbps downstream and 200 Kbps upstream speeds. The data reported includes broadband service by all types of platforms except for satellite and terrestrial mobile wireless broadband service.

⁵² Research funded by the ARRA and compliant with SBDD data requirements and definitions.

Table 4 – Estimate of Available Terrestrial Fixed Broadband Service of At Least 768Kbps Downstream – 200Kbps Upstream

Selected States

	Density of Households Across State	Households with Available Broadband Service
Alaska	0.39	85.55%
Florida	117.53	96.23%
Illinois	82.61	97.96%
Iowa	20.57	95.36%
Kansas	12.69	97.23%
Michigan	66.64	95.41%
Minnesota	23.81	95.55%
Nevada	6.84	97.29%
Ohio	108.57	97.90%
Puerto Rico	368.62	91.27%
South Carolina	50.94	95.32%
Tennessee	54.17	92.25%
Texas	28.24	96.52%

Data includes all terrestrial technology platforms except for mobile broadband services.

Source: Availability data from Connect Iowa, 2010. Household density data from U.S.Census, 2000, U.S. Census Bureau.

Data from Illinois, Kansas, and Tennessee dates from March, 2010. Data from Florida, Michigan, Minnesota, Nevada, Ohio, Puerto Rico, and South Carolina from April, 2010. Data from Iowa and Texas from May, 2010. Data from Alaska from June 2010.

The average broadband household availability measured across these 13 states and territories is 94.91%, suggesting that the broadband inventory measured in Iowa is in line with estimates across these states.

3.1.2 Broadband Availability by Technology Platform

The spring 2010 Iowa Broadband Inventory Map is based on data from 167 terrestrial fixed broadband providers. Together these broadband providers offer service to an estimated 95.36% of the Iowa households. An examination of the broadband market by technology platform reveals trends that suggest that the Iowa broadband market offers some unique characteristics.

The Iowa broadband sector, like the Iowa telecommunications sector, is characterized by a large number of small providers. According to FCC Form 477 data, Iowa has the largest number of broadband providers across any

state in the nation.⁵³ Consistent with FCC data, research shows that the most represented technology across the state is Digital Subscriber Line (DSL), the technology most used by traditional telecommunications service providers. Table 5 below reports that there are a total of 117 DSL providers accounted for in the state of Iowa broadband map serving an estimate of 996,000 households, or 86.64%. The relatively small scale of broadband providers serving Iowans likely has a significant impact upon infrastructure development across the state. This is due to the fact that under the current structure of the Universal Service Fund, small providers are more likely than larger providers to qualify for these types of USF subsidies.⁵⁴

There are a total of 34 cable providers reflected on the map, serving 73.30% of the state's households. Fixed wireless penetration is relatively high with a total of 47 fixed wireless providers supplying service to 54.22% of households across the states. This high percentage of households served is in line with industry expectations since fixed wireless technology is a cost effective solution, especially in areas of low population density. Fiber penetration is relatively low with 44 providers offering fiber to the premise to 8.91% of households. There are 6 facilities-based mobile broadband providers in Iowa who collectively provide service to 90.56% of Iowa households.

Table 5 – Availability Estimate by Broadband Platform in the State of Iowa

Platform Type	Served Households (000s)	Percent of Households Served	Number of Providers - By Platform
Cable	842	73.30%	34
DSL	996	86.64%	117
Fiber	102	8.91%	44
Fixed Wireless	623	54.22%	47
Mobile	1,041	90.56%	6
Total -All Platform Except Mobile	1,096	95.36%	167
Total – All Platforms	1,142	99.37%	173

Note: The numbers of providers across each platform do not add up to the total of 173 due the fact that providers may offer service using various technology platforms.

Source: Connect Iowa, May 2010.

The breakdown of broadband penetration by technology showcases unique structural characteristics of the Iowa broadband market. The most important among them is the large number of small DSL providers.

3.1.3 Household Density Across Unserved, Underserved, and Served Areas

Iowa is a largely rural state with a large portion of its population living in areas with low density of population. Given the direct correlation between density of population and the cost of providing broadband infrastructure, this factor should have a significant role in explaining infrastructure investment across Iowa. The average density or

⁵³ High-Speed Services for Internet Access: Status as of December 31, 2008, Industry Analysis and Technology Division Wireline Competition Bureau, Federal Communications Commission, February 2010. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296239A1.pdf

⁵⁴ USF NOI, ¶13.

number of households, per square mile, across Iowa is 20.6, varying greatly by county (see county level analysis in Section 3.2).⁵⁵ Table 6 presents average household density by Census Block in areas that the mapping exercise measures as unserved, underserved, and served, based on NTIA definitions. Analysis of served and unserved territories by density of households is an important measure that provides an objective means to assess the challenge of infrastructure build-out in unserved or underserved areas. It also provides critical information for the debate over Universal Service Fund reform underway. These data will further assist in benchmarking the “supply-side” challenge faced in Iowa against national data. At the present time, national benchmarks do not exist. As further data is released across states from the SBDD mapping efforts, it will be possible to assess this comparative analysis between Iowa and other states. Further, these data provide an objective benchmark for assessing progress of infrastructure build-out moving forward, based on future SBDD data submissions.

Consistent with expectations, the data show correlation between density of households and infrastructure build-out across Iowa. The average density of households per Census Blocks measured as unserved is 3.66, when accounting for all Census Blocks, and 4.19 when considering only Census Blocks with population. The average household density among underserved Census Blocks with population is 7.21. The average density of households in Census Blocks where service of least at 768 Kbps download speeds is offered is 29.19. When considering only areas that have service offered with download speeds of 3 Mbps or more, average population density across areas is estimated at 39.94. It is important to note, as discussed in Section 3.2 below, that an analysis of data at the county level reveals that this correlation does not hold across all counties.

Table 6 – Average Number of Households Per Square Mile Across Census Blocks with Fixed, Terrestrial Broadband Available

By Download Speeds	All Census Blocks	Census Blocks with Households
Below 768 Kbps - “Unserved”	3.66	4.19
Between 768-3000 Kbps - “Underserved”	6.52	7.21
At Least 768 Kbps	26.29	29.19
At Least 3 Mbps	35.91	39.94

Note: Data does not include mobile or satellite broadband.

Source: Connect Iowa, May 2010.

Table 7 reports broadband availability in Iowa across areas defined as “rural” by the NTIA SBDD definition standards.⁵⁶ According to this definition approximately 640,000 households across Iowa are classified as rural (or 55.6% of total households). Of this, approximately 587,000 households are served by at least one terrestrial, non-mobile broadband provider with at least 768 Kbps download and 200 Kbps upload speeds, or 91.89% of all rural households. The number of rural households remaining unserved is estimated to be 52,000. The total number of households – rural and non-rural – estimated to be unserved across Iowa is 53,335. Hence, as expected, the

⁵⁵ U.S.Census, 2000,U.S.Census Bureau. Household density is defined as number of households per square mile of land area.

⁵⁶ “Rural Area. Any area, as confirmed by the latest decennial census of the Bureau of the Census, which is not located within: (i) a city, town, or incorporated area that has a population of greater than 20,000 inhabitants; or (ii) an urbanized area contiguous and adjacent to a city or town that has a population of greater than 50,000 inhabitants. For purposes of the definition of rural area, an urbanized area means a densely populated territory as defined in the latest decennial census of the U.S. Census Bureau.”

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This analysis includes only used Census Blocks that following this definition are completely rural, and not any Census Blocks that fell within both rural and non-rural.

overwhelming majority of unserved households (97.1%) are in rural areas. When considering all terrestrial networks including mobile wireless, an estimated 98.9% of rural households are estimated to be served by at least one broadband provider.

Table 7 – Rural Availability Estimate of Broadband Service of at Least 768 Kbps Download/200 Kbps Upload

Platform Type	Total Rural Households	Unserved Rural Households	Percent of Rural Households Served
Fixed Broadband (Excluding Mobile)	639,177	51,806	91.89%
All Terrestrial Platforms (Including Mobile)	639,177	7,061	98.9%

3.1.4 All Terrestrial Broadband Inventory – Including Mobile Wireless Networks

Table 8 represents data of availability of broadband across Iowa including all types of terrestrial platform, including mobile broadband. In May 2010, there were a total of six facilities-based mobile broadband providers in Iowa, collectively serving an estimated 90.56% of all households.^{57,58}

Taking into account both fixed and mobile broadband service available, an estimated 99.37% of Iowa households had broadband available from at least one provider at download speeds of 768 Kbps or higher. This implies that 0.63% of households remain unserved by a terrestrial broadband connection (including mobile). Additionally, an estimated 96.94% of all households have broadband available from at least one terrestrial platform, including mobile, of 3-6 Mbps download speeds and 77.27% of Iowa households had broadband available at 6 Mbps download speeds or higher.

Table 8 – Estimate of Broadband Service Availability in the State of Iowa – By Speed Tier – All Terrestrial Platforms (Including Mobile)

SBDD Download Speed Tiers	Unserved Households	Served Household	Percent Households by Tier
At Least 768-1500 Kbps	7,218	1,142,058	99.37%
At Least 1.5-3 Mbps	13,409	1,135,867	98.83%
At Least 3-6 Mbps	35,137	1,114,139	96.94%
6 Mbps or more	261,000	888,000	77.27%

Source: Connect Iowa, May 2010.

⁵⁷ Connect Iowa, Spring 2010.

⁵⁸ Note that this measure of broadband availability is based on households passed, not geography served. Further, consumers may experience lower availability of mobile broadband service since typically each consumer has access to only one mobile broadband provider. Hence, existence of mobile broadband service by one provider does not necessary imply that all mobile subscribers have access at that location. Only subscribers to the mobile services available within that location will experience reception.

3.2 Broadband Availability by County Across the State of Iowa

3.2.1 Terrestrial, Fixed Broadband Availability by County

This section examines the estimated broadband inventory by county across Iowa. Figures 5 and 6 below present the estimated number and percentage of households served by terrestrial, non-mobile broadband at speeds of 768 Kbps download/200 Kbps upload and above as well as 3 Mbps download speeds or more and including household density by county.⁵⁹ These data are also presented under Table 9. The data reveals large variances in measured broadband inventory across counties, highlighting the importance of granular data in order to identify gaps in infrastructure and adoption at the community level. Such information is essential to develop pragmatic policy solutions tailored to the challenges facing each community.

While the estimated statewide percentage of households served by at least 768 Kbps download/200 Kbps upload speeds is 95.36%, Table 9 reports significant heterogeneity of infrastructure build-out across counties ranging from Ringgold County in the south, with only 68.73% of households served, to Pocahontas County with 99.98% of households served. Among the ten counties with the highest estimated percentage of homes served, only two – Polk and Scott Counties – are urban, while six are rural: Pocahontas, Decatur, Clay, Palo Alto, Winnebago, and Calhoun. These data reveal that across some Iowa counties, density of population (a critical factor determining infrastructure build-out capital investment) is not a good indicator of historical investment in broadband infrastructure.

This same pattern exists when analyzing estimates of homes served at download speeds of 3 Mbps or more. While the estimated statewide percentage of households served at speeds of 3 Mbps or more is 87.60%, county availability estimates range from Fremont County, with only 30.64% of households served, to Story County, with 99.88% of households served. Among the ten counties with the highest estimated percentage of served homes at these speeds, seven are highly rural. Those counties are: Decatur, Winnebago, Clay, Pocahontas, Calhoun, Emmet, and Boone.

Detailed information on the estimated inventory of broadband in each county can be found on the Connect Iowa website at http://connectiowa.org/mapping/county_maps/. For more granular information regarding the estimated broadband inventory see the Iowa online broadband inventory map at http://connectiowa.org/mapping/_interactive_map_interface/?q=map.

⁵⁹ Based on NTIA definitions, broadband is defined as 768 Kbps download and 200 Kbps upload speeds or more. Areas with service below these speeds is deemed “unserved.” Areas where broadband is available at speeds between 768 Kbps download and 200 Kbps upload and 3Mbps are defined as “underserved.” Areas where broadband is available at 3Mbps or above are defined as “served.”
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Figure 5

Broadband Availability in the State of Iowa Percentage of Households Served by Terrestrial, Non-Mobile Broadband Service

At Least 768 Kbps Download/200 Kbps Upload Speeds
Statewide Availability: 95.36%

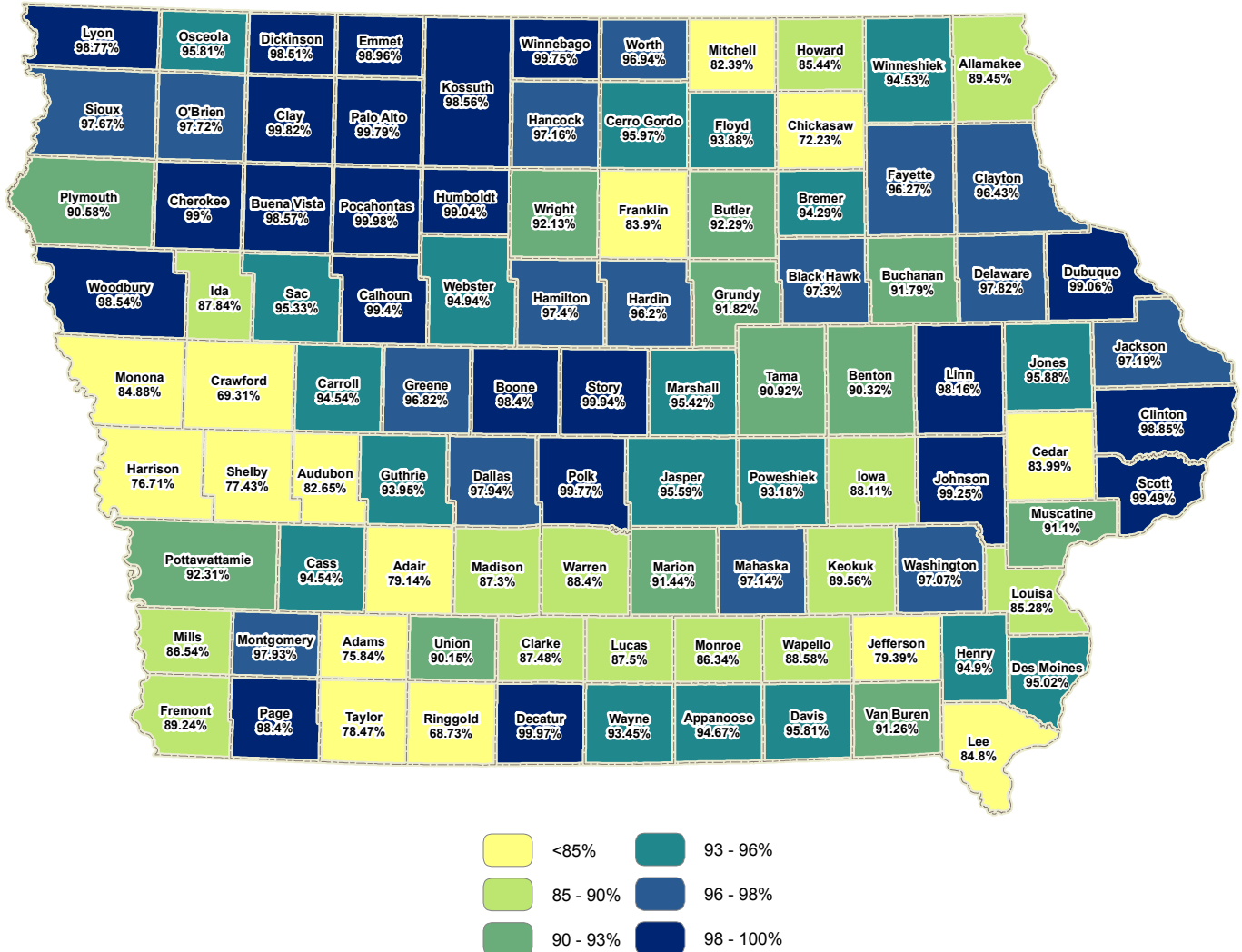


Figure 6

Broadband Availability in the State of Iowa Percentage of Households Served by Terrestrial, Non-Mobile Broadband Service

At Least 3 Mbps Download Speeds
Statewide Availability: 87.60%

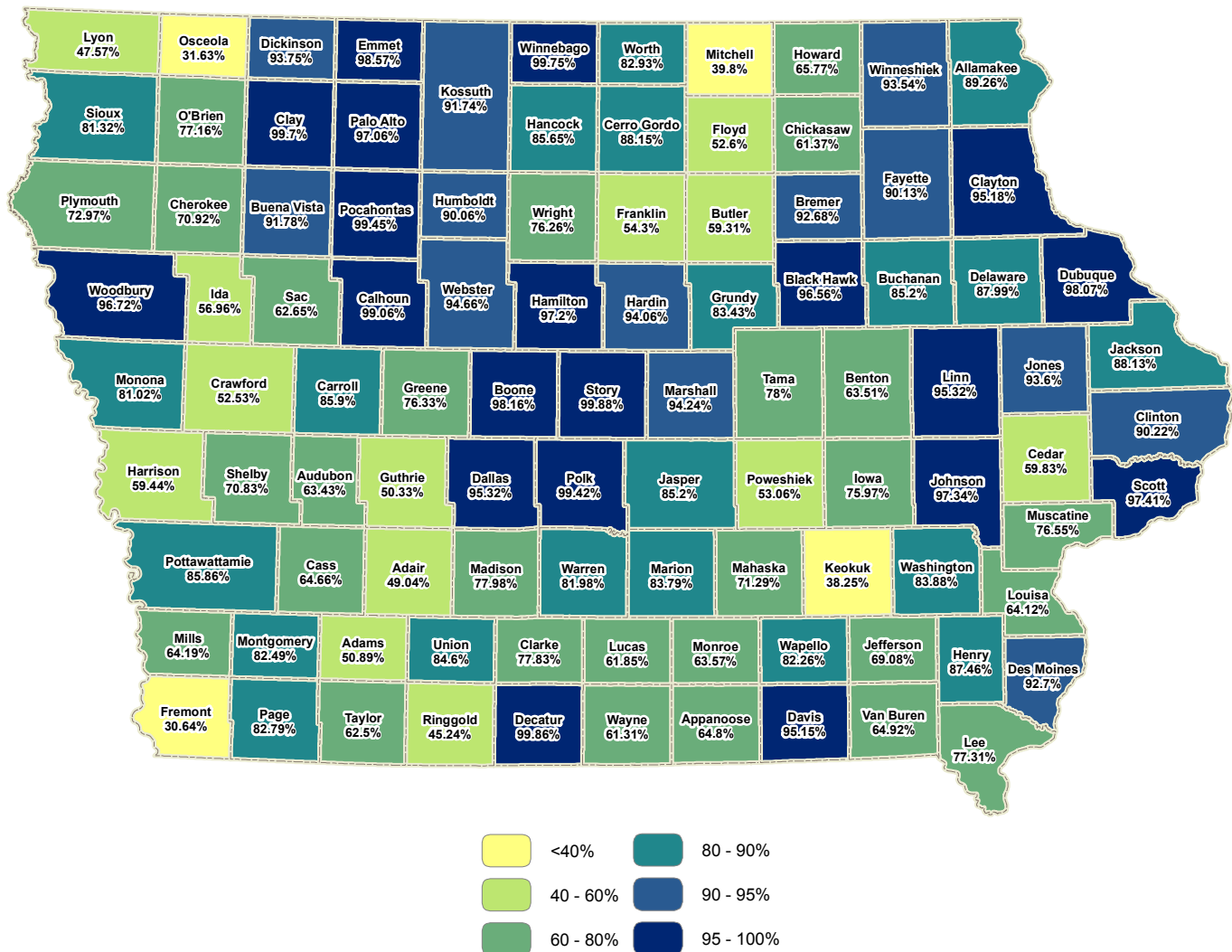


Table 9 – Estimated Availability of Broadband Service by County
Terrestrial Broadband (Excluding Mobile)

			≥ 768 Download/200 Upload Kbps Speeds	≥ 3Mbps Download Speeds
County	Household Density	Number of Households	Percentage Households Served	
Adair County	6.0	3,398	79.14%	49.04%
Adams County	4.4	1,867	75.84%	50.89%
Allamakee County	8.9	5,722	89.45%	89.26%
Appanoose County	11.6	5,779	94.67%	64.80%
Audubon County	6.3	2,773	82.65%	63.43%
Benton County	13.6	9,746	90.32%	63.51%
Black Hawk County	87.6	49,683	97.30%	96.56%
Boone County	18.2	10,374	98.40%	98.16%
Bremer County	20.2	8,860	94.29%	92.68%
Buchanan County	13.9	7,933	91.79%	85.20%
Buena Vista County	13.0	7,499	98.57%	91.78%
Butler County	10.6	6,175	92.29%	59.31%
Calhoun County	7.9	4,513	99.40%	99.06%
Carroll County	14.9	8,486	94.54%	85.90%
Cass County	10.8	6,120	94.54%	64.66%
Cedar County	12.3	7,147	83.99%	59.83%
Cerro Gordo County	34.1	19,374	95.97%	88.15%
Cherokee County	9.3	5,378	99.00%	70.92%
Chickasaw County	10.3	5,192	72.23%	61.37%
Clarke County	8.3	3,584	87.48%	77.83%
Clay County	12.8	7,259	99.82%	99.70%
Clayton County	9.5	7,375	96.43%	95.18%
Clinton County	28.9	20,105	98.85%	90.22%

			≥ 768 Download/200 Upload Kbps Speeds	≥ 3Mbps Download Speeds
County	Household Density	Number of Households	Percentage Households Served	
Crawford County	9.0	6,441	69.31%	52.53%
Dallas County	26.6	15,584	97.94%	95.32%
Davis County	6.4	3,207	95.81%	95.15%
Decatur County	6.3	3,337	99.97%	99.86%
Delaware County	11.8	6,834	97.82%	87.99%
Des Moines County	41.5	17,270	95.02%	92.70%
Dickinson County	18.6	7,103	98.51%	93.75%
Dubuque County	55.4	33,690	99.06%	98.07%
Emmet County	11.2	4,450	98.96%	98.57%
Fayette County	12.0	8,778	96.27%	90.13%
Floyd County	13.6	6,828	93.88%	52.60%
Franklin County	7.5	4,356	83.90%	54.30%
Fremont County	6.3	3,199	89.24%	30.64%
Greene County	7.4	4,205	96.82%	76.33%
Grundy County	9.9	4,984	91.82%	83.43%
Guthrie County	7.9	4,641	93.95%	50.33%
Hamilton County	11.6	6,692	97.40%	97.20%
Hancock County	8.4	4,795	97.16%	85.65%
Hardin County	13.4	7,628	96.20%	94.06%
Harrison County	8.8	6,115	76.71%	59.44%
Henry County	17.6	7,626	94.90%	87.46%
Howard County	8.4	3,974	85.44%	65.77%
Humboldt County	9.9	4,295	99.04%	90.06%
Ida County	7.4	3,213	87.84%	56.96%
Iowa County	10.5	6,163	88.11%	75.97%
Jackson County	12.7	8,078	97.19%	88.13%
Jasper County	20.1	14,689	95.59%	85.20%

			≥ 768 Download/200 Upload Kbps Speeds	≥ 3Mbps Download Speeds
County	Household Density	Number of Households	Percentage Households Served	
Jefferson County	15.3	6,649	79.39%	69.08%
Johnson County	71.7	44,080	99.25%	97.34%
Jones County	13.1	7,560	95.88%	93.60%
Keokuk County	7.9	4,586	89.56%	38.25%
Kossuth County	7.2	6,974	98.56%	91.74%
Lee County	29.3	15,161	84.80%	77.31%
Linn County	107.0	76,753	98.16%	95.32%
Louisa County	11.2	4,519	85.28%	64.12%
Lucas County	8.9	3,811	87.50%	61.85%
Lyon County	7.5	4,428	98.77%	47.57%
Madison County	9.5	5,326	87.30%	77.98%
Mahaska County	15.6	8,880	97.14%	71.29%
Marion County	21.7	12,017	91.44%	83.79%
Marshall County	26.8	15,338	95.42%	94.24%
Mills County	12.2	5,324	86.54%	64.19%
Mitchell County	9.2	4,294	82.39%	39.80%
Monona County	6.1	4,211	84.88%	81.02%
Monroe County	7.4	3,228	86.34%	63.57%
Montgomery County	11.5	4,886	97.93%	82.49%
Muscatine County	36.1	15,847	91.10%	76.55%
O'Brien County	10.5	6,001	97.72%	77.16%
Osceola County	7.0	2,778	95.81%	31.63%
Page County	12.5	6,708	98.40%	82.79%
Palo Alto County	7.3	4,119	99.79%	97.06%
Plymouth County	10.9	9,372	90.58%	72.97%
Pocahontas County	6.3	3,617	99.98%	99.45%
Polk County	261.9	149,112	99.77%	99.42%

			≥ 768 Download/200 Upload Kbps Speeds	≥ 3Mbps Download Speeds
County	Household Density	Number of Households	Percentage Households Served	
Pottawattamie County	35.5	33,844	92.31%	85.86%
Poweshiek County	12.6	7,398	93.18%	53.06%
Ringgold County	4.2	2,245	68.73%	45.24%
Sac County	8.2	4,746	95.33%	62.65%
Scott County	136.1	62,334	99.49%	97.41%
Shelby County	8.8	5,173	77.43%	70.83%
Sioux County	13.9	10,693	97.67%	81.32%
Story County	51.3	29,383	99.94%	99.88%
Tama County	9.7	7,018	90.92%	78.00%
Taylor County	5.3	2,824	78.47%	62.50%
Union County	12.4	5,242	90.15%	84.60%
Van Buren County	6.6	3,181	91.26%	64.92%
Wapello County	34.2	14,784	88.58%	82.26%
Warren County	25.7	14,708	88.40%	81.98%
Washington County	14.2	8,056	97.07%	83.88%
Wayne County	5.4	2,821	93.45%	61.31%
Webster County	22.2	15,878	94.94%	94.66%
Winnebago County	11.9	4,749	99.75%	99.75%
Winneshiek County	11.2	7,734	94.53%	93.54%
Woodbury County	44.9	39,151	98.54%	96.72%
Worth County	8.2	3,278	96.94%	82.93%
Wright County	10.2	5,940	92.13%	76.26%
STATE TOTAL	20.6	1,149,276	95.36%	87.60%

Source: Household Numbers and Density - Census Bureau, 2000. Broadband Availability Rates - Connect Iowa, Spring 2010.

3.2.2 Fixed Broadband Availability Across Rural and Non-Rural Counties

Figure 7 below depicts the percentage of households served by county with at least 768 Kbps download and 200 Kbps upload speeds and classifies counties according to rural and non-rural.⁶⁰ Across rural counties an estimated 91.84% of households have broadband available. The average estimate across non-rural (urban and suburban) counties is 94.20%.⁶¹ The average estimate of broadband availability across urban counties is 98.94%.⁶² Hence, as expected, broadband penetration is on average lower across rural counties and greatest in highly populated urban areas. Therefore, there are significant outliers in the state of Iowa, with estimates of broadband penetration in some rural counties being significantly high, while estimates in non-rural counties are below state averages.

Despite it being a mostly rural region, the northwest portion of the state has high estimates for broadband availability. All counties in the northwest quadrant of the state except for Ida, Plymouth, and Sac, have estimates of broadband availability above the state average of 95.36%. Further, some of these rural counties have the highest estimate of broadband availability in the state. Estimates of broadband inventory in Palo Alto, Pocahontas, and Calhoun indicate universal service of broadband, significantly above statewide availability estimates and national benchmarks. By contrast, most southern and western counties have relatively low estimates of broadband availability. The exceptions are Montgomery, Page, and Decatur counties, all of which have estimated availability rates above the state average.

⁶⁰ Classification of rural and non-rural counties is based on the U.S. Census Bureau urban-rural classification based on Metropolitan Statistical Areas (MSAs), which are designated by the United States Office of Management and Budget to collect, tabulate, and publish federal statistics. Metropolitan statistical areas contain a core urban area with a population of 50,000 or more. According to Census Bureau county classification, counties are categorized as "urban" if they contain the core city of an MSA, "suburban" counties are MSA counties that do not contain a core city, and "rural" counties include all remaining counties that are not part of an MSA.

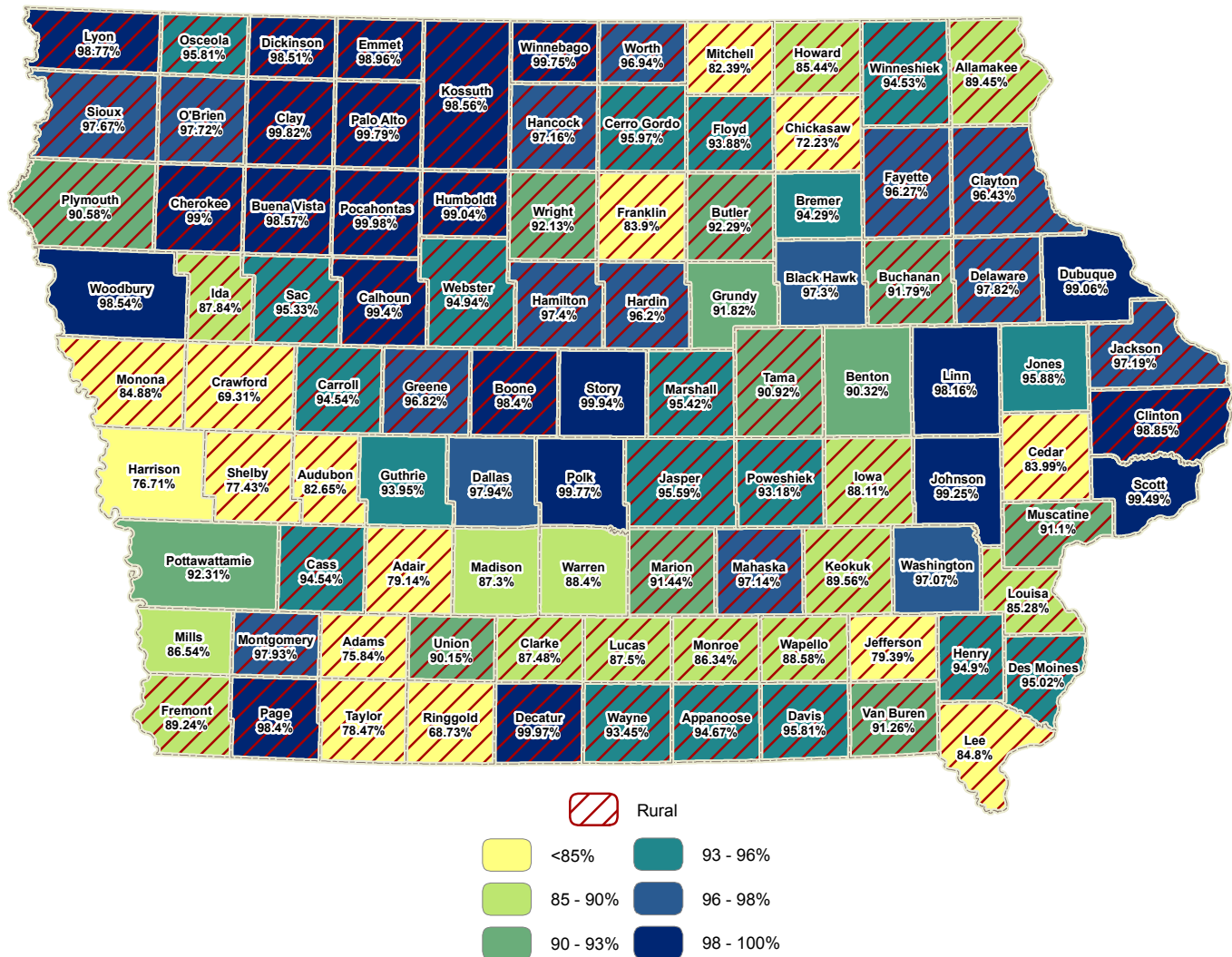
⁶¹ This simple average county-level availability estimate of 92.32% is lower than the statewide estimate of percentage of households with broadband available (95.36%). This is due to the fact that the county-level simple average does not weight county estimates by the underlying population in each county.

⁶² Counties classified as urban include: Polk, Story, Dubuque, Scott, Johnson, Woodbury, Black Hawk, and Linn.

Figure 7

Broadband Availability in the State of Iowa Percentage of Households Served by Terrestrial, Non-Mobile Broadband Service

At Least 768 Kbps Download/200 Kbps Upload Speeds
Rural and Non-Rural Counties



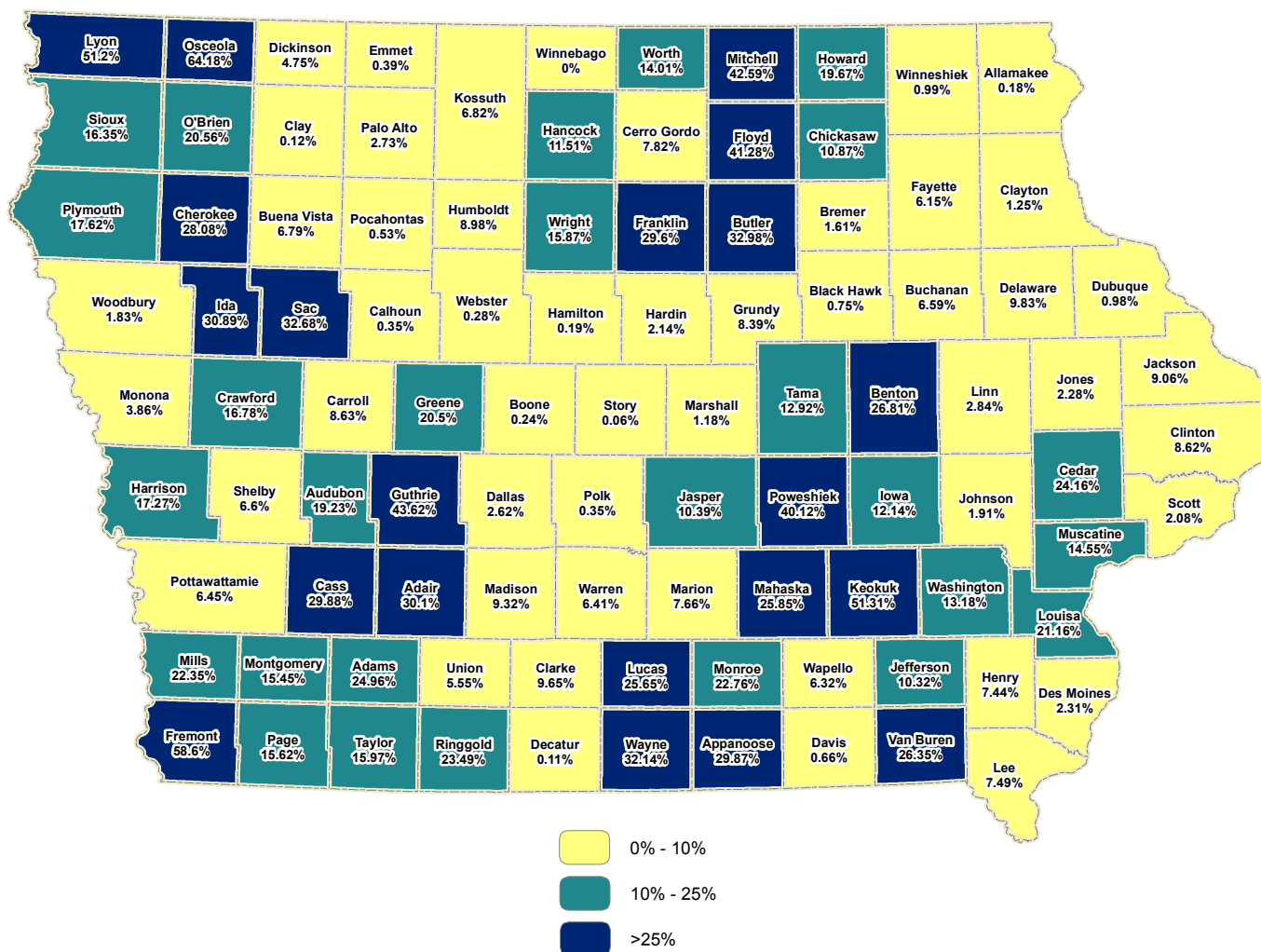
3.2.3 “Underserved” Households, by County

Figure 8 reports the percentage of households with fixed broadband available at download speeds greater than 768 Kbps but below 3 Mbps, by county. This represents the percentage of households in each county that are “underserved.”⁶³ Across the state, 7.76% of households have broadband available at this intermediate speed range. The county data identifies where investment has taken place for “basic” broadband but where speed upgrades are lagging behind. Across all urban counties and a number of suburban and rural counties, there are few underserved households. However, across a number of rural counties and some suburban counties, large numbers of households have broadband available only at speeds below 3 Mbps. Most notably the following counties have the largest percentage of “underserved” households: Osceola, Fremont, Keokuk, Lyon, Guthrie, Mitchell, Floyd, Poweshiek, Butler, Sac, and Wayne.

Figure 8

Broadband Availability in the State of Iowa

Percentage of Households Served at Download Speeds Between 768 Kbps and 3 Mbps
Percent of “Underserved” Households



⁶³ This estimate includes fixed, terrestrial platforms but excludes mobile wireless platform service territory. The data also excludes service territory served by satellite providers. NTIA’s definition of “underserved” is based on speed tiers only and does not differentiate across platforms.

3.2.4 Broadband Availability by Platform, by County

Table 10 reports measured percentage of households served by the type of platform by each county, including: cable, DSL, fiber, fixed wireless, and mobile wireless technologies.

Table 10 – County-Level Estimated Availability by Broadband Technology						
Percentage of Households Served by Broadband, by Technology Platform (≥ 768 Download/200 Upload Kbps Speeds)						
County	Cable	DSL	Fiber	Fixed Wireless	Mobile Wireless	All Platforms Except Mobile
Adair County	34.03	78.01	0	14.11	100	79.14
Adams County	44.36	70.79	0	4.01	74.98	75.84
Allamakee County	47.43	78.8	0.53	56.19	13.59	89.45
Appanoose County	46.66	80.95	8	86.69	99.69	94.67
Audubon County	38.33	78.76	0	19.93	100	82.65
Benton County	39.68	85.89	0.04	38.97	68.58	90.32
Black Hawk County	90.78	88.6	0	20.38	100	97.3
Boone County	61.77	83.03	5.47	96.33	100	98.4
Bremer County	57.48	89.78	3.68	34.93	97.62	94.29
Buchanan County	43.26	83.9	0	36.33	97.2	91.79
Buena Vista County	64.48	81.82	0.06	94.57	96.17	98.57
Butler County	41.48	80.79	14.14	27.9	30.91	92.29
Calhoun County	50.61	86.99	11.48	98.04	100	99.4
Carroll County	68.68	92.34	51.19	32.87	100	94.54
Cass County	51.48	89.59	0	62.5	99.99	94.54
Cedar County	38.34	72.7	28.43	15.05	100	83.99
Cerro Gordo County	86.7	65.62	1.94	69.23	99.95	95.97
Cherokee County	45.39	77.8	6.6	98.3	99.04	99
Chickasaw County	51.29	68.97	0	4.1	15.43	72.23
Clarke County	53.87	87.3	0	0.81	98.69	87.48
Clay County	71.33	72.57	18.1	97.64	95.91	99.82
Clayton County	41.67	79.26	20.69	61.58	25.19	96.43
Clinton County	75.73	83.94	3.38	92.28	99.95	98.85

County	Cable	DSL	Fiber	Fixed Wireless	Mobile Wireless	All Platforms Except Mobile
Crawford County	41.65	67.44	0	0.86	100	69.31
Dallas County	76.65	81.27	4.28	86.52	99.99	97.94
Davis County	34.83	94.65	53.61	1.02	98.44	95.81
Decatur County	50.58	99.86	0	0.93	30.7	99.97
Delaware County	37.31	82.66	0	87.3	98.92	97.82
Des Moines County	79.37	88.53	0	1.92	99.13	95.02
Dickinson County	81.4	92.55	0.32	58.39	99.92	98.51
Dubuque County	83.11	88.66	1.98	96.9	99.89	99.06
Emmet County	61.31	92.16	0	96.63	4.22	98.96
Fayette County	55.79	84.69	0	77.51	34.99	96.27
Floyd County	70.72	81.32	0	85.41	42.86	93.88
Franklin County	48.17	69.26	0.22	71.88	33.99	83.9
Fremont County	0.21	77.12	0	59.02	99.81	89.24
Greene County	0	94	14.51	11.35	100	96.82
Grundy County	54.55	79.61	0	80.89	47.3	91.82
Guthrie County	16.97	79.15	15.94	78.66	99.99	93.95
Hamilton County	58.22	64.5	15.38	97.51	100	97.4
Hancock County	46.93	62.15	22.96	75.25	83.73	97.16
Hardin County	46.26	88.01	4.57	57.24	26.06	96.2
Harrison County	45.05	75.91	0.84	0.12	96.89	76.71
Henry County	52.92	78.48	8.88	68.92	99.63	94.9
Howard County	57.01	77.77	0	65.17	9.18	85.44
Humboldt County	57.05	74.43	0	99.47	100	99.04
Ida County	51.44	64.83	0	77.31	99.97	87.84
Iowa County	50.26	86.28	0.64	17.91	99.96	88.11
Jackson County	44.6	83.42	13.41	78.98	98.29	97.19
Jasper County	69.91	90.52	0.03	14.42	100	95.59
Jefferson County	61.46	77.86	0.08	2.72	99.95	79.39

County	Cable	DSL	Fiber	Fixed Wireless	Mobile Wireless	All Platforms Except Mobile
Johnson County	88.68	93.93	3.59	68.97	99.68	99.25
Jones County	59.1	75.8	6.91	57.15	99.8	95.88
Keokuk County	35.61	70.08	0	73.52	99.86	89.56
Kossuth County	50.7	83.43	0.63	94.09	79.61	98.56
Lee County	70.61	76.93	0	0	97.41	84.8
Linn County	90.53	94.82	80.61	1.45	99.99	98.16
Louisa County	48.04	79.39	0	10	98	85.28
Lucas County	52.15	77.45	0	83.7	27.82	87.5
Lyon County	39.85	85.17	0	83.99	0	98.77
Madison County	45	75.68	0	63.57	100	87.3
Mahaska County	66.09	75.25	61.39	95.18	100	97.14
Marion County	71.22	87.74	0	69.39	99.89	91.44
Marshall County	78.84	90.39	0	8.66	99.53	95.42
Mills County	40.31	81.29	0	12.1	99.92	86.54
Mitchell County	58.13	65.09	0	55.19	19.18	82.39
Monona County	70.91	84.51	0	1.66	99.49	84.88
Monroe County	57.1	69.86	0	80.82	99.59	86.34
Montgomery County	72.71	87.94	0	72.58	99.67	97.93
Muscatine County	79.46	82.94	8.94	13.56	99.96	91.1
O'Brien County	32.65	84.1	0.38	94.86	0.01	97.72
Osceola County	59.45	77.87	0.06	75.96	0.01	95.81
Page County	70	90.39	0	91.11	99.85	98.4
Palo Alto County	39.39	83.31	11.69	91.13	21.09	99.79
Plymouth County	65.85	52.81	0	22.81	99.54	90.58
Pocahontas County	45.68	70.94	0	99.89	82.58	99.98
Polk County	97.12	97.18	0.14	76.07	100	99.77
Pottawattamie County	82.16	80.95	1.73	2.52	99.93	92.31
Poweshiek County	47.25	90.92	0	13.35	99.81	93.18

County	Cable	DSL	Fiber	Fixed Wireless	Mobile Wireless	All Platforms Except Mobile
Ringgold County	39.9	68.67	0	0	42.22	68.73
Sac County	22.03	74.97	0	63.14	100	95.33
Scott County	94.26	96.69	0	60.95	99.99	99.49
Shelby County	47.42	64.82	2.58	54.82	100	77.43
Sioux County	73.63	89.66	0	69.9	0.01	97.67
Story County	82.09	91.44	5.41	98.7	99.98	99.94
Tama County	55.87	77.29	0	45.21	42.49	90.92
Taylor County	50.24	77.24	0	4.82	81.18	78.47
Union County	65.07	90.08	0	0	95.53	90.15
Van Buren County	0	91.26	0	0	99.64	91.26
Wapello County	80.07	79.59	0.02	6.5	99.98	88.58
Warren County	67.31	78.55	32.26	38.26	99.69	88.4
Washington County	59.68	89.68	1.35	68.35	99.96	97.07
Wayne County	25.19	88.92	0	75.16	15.54	93.45
Webster County	72.25	83.42	8.67	93.02	100	94.94
Winnebago County	44.67	99.62	0	21.36	5.89	99.75
Winneshiek County	54.32	75.66	0.31	84.32	80.89	94.53
Woodbury County	87.6	94.75	0	91.38	99.88	98.54
Worth County	48.26	81.47	0	68.82	56.9	96.94
Wright County	65.27	74.16	1.44	89.4	100	92.13
State Total	73.30	86.64	8.91	54.22	90.56	95.36

Source: Connect Iowa, May 2010

3.3 The Impact of Universal Service Funding, High Cost Support Across Iowa's Counties

This section assesses the impact of the Universal Service Fund (USF) High Cost (HC) support program across counties in the state of Iowa. The section examines broadband penetration across counties with various degrees of eligibility to receive funding under three key components of the USF High Cost support program: High Cost Loop support (HCL), Interstate Common Line Support (ICLS), and Local Switching Support (LSS) programs. The High Cost support program is designed to ensure that consumers in all regions of the nation have access to and pay rates for telecommunications services that are reasonably comparable to those services provided and rates paid in urban areas.

- **High Cost Loop** support is available to rural price-cap and rate-of-return incumbent carriers and competitive carriers providing service in the areas of these rural companies, which must be designated as eligible telecommunications carriers (ETCs) by their state commissions or the FCC. The HCL program provides support for the "last mile" of connection for rural companies in service areas where the cost to provide this service exceeds 115% of the national average cost per line.⁶⁴
- **Interstate Common Line Support** is available only to rate-of-return incumbent carriers (mostly rural and some non-rural carriers) and competitive carriers providing service in the areas of these incumbent carriers. These carriers must be designated as ETCs. Interstate Common Line Support helps to offset interstate access charges and is designed to permit each rate-of-return carrier to recover its common line revenue requirement, while ensuring that its subscriber line charges (SLCs) remain affordable to its customers.⁶⁵
- **Local Switching Support** is available to rural incumbent carriers serving 50,000 lines or fewer (mostly rate-of-return and some price-cap carriers) and competitive carriers providing service in the areas of these rural incumbent carriers, who must be designated as ETCs. Local Switching Support is designed to help carriers recoup some of the high fixed switching costs of providing service to fewer customers. LSS helps keep customer rates comparable to more densely populated urban areas.⁶⁶

The High Cost support program is historically the largest component of the USF program and the HCL, ICLS, and LSS programs represent the largest portion of HC disbursements in the state of Iowa. The FCC projects a total of \$8.7 billion for the federal Universal Service Fund in 2010. Of this total, \$4.6 billion are projected for the High Cost program, currently providing funding to an estimated 1,800 eligible telecommunications carriers; \$1.2 billion are projected to subsidize low income households under the Lifeline and Linkup programs; \$2.7 billion are projected for the school and libraries "E-Rate" program; and \$214 million are projected for the Rural Health Care subsidy program.⁶⁷

In 2009 the total USF program disbursement in the state of Iowa amounted to \$142.2 million, for a total disbursement in the state of \$1.027 billion from 1998 to 2009. High Cost support disbursements for the state of Iowa in 2009 totaled \$127 million, for a total of \$897.5 million between 1998 and 2009. Of these, disbursements in Iowa in 2009 amounted to \$38.9 million for HCL, \$53.5 million for ICLS, and \$24.3 million LSS.⁶⁸ Table 11 summarizes these data.

64 NBP, p. 140 and Annual Report, 2010, Universal Service Administration Company. ("Annual Report 2009, USAC"). Available at: http://www.usac.org/_res/documents/about/pdf/usac-annual-report-2009.pdf

65 Ibid.

66 Ibid.

67 Ibid.

68 Annual Report, 2009, USAC, p. 39-48.

Table 11 – Universal Service Fund Disbursements in the State of Iowa – 1998-2009 (millions)

	2009	From 1998-2009
High Cost Loop	\$38.9	
Interstate Common Line	\$53.5	
Local Switching	\$24.3	
Total High Cost Component	\$127	\$897.5
Total USF Disbursement	\$142.2	\$1,027

Source: Annual Report, 2009. USAC

Based on data provided by the Iowa Utilities Board concerning the degree of county geography served by providers eligible for HC support, this section analyzes the impact of the HCL, ICLS, and LSS programs across counties in Iowa in relation to county-level broadband availability estimates. Figure 9 describes the percentage of county-level territory that is served by providers eligible for HCL, LSS, and ICLS programs, as well as availability estimates by county.

While these data capture a significant portion of the USF federal program, it is important to note that the data provides only a partial assessment of the overall USF program. First, the data does not include information regarding other USF program disbursements in the state supporting low income households, rural healthcare, or schools and libraries. Further, the data available is insufficient to identify the total funding invested in each county or average subsidies per household represented by the historical federal funding. Finally, the data is insufficient to ascertain total disbursement used to finance broadband network expansion and operations rather than traditional telephone services.

Hence, it is important to note that the analysis in this section provides a partial assessment of the impact of USF funding across Iowan communities and not a comprehensive view of the impact of USF funding across the state. Therefore, the data is suggestive in a number of ways.

Across Iowa there are multiple providers that receive funding under the HC support program. This is consistent with the notion that under current USF rules, small rate-of-return providers are more likely to receive funding under this program. According to the FCC, in 2009, nationally approximately \$2 billion of the High Cost program went to 814 rate-of-return carriers, \$1 billion to 17 price-cap carriers and \$1.3 billion to 212 competitive eligible telecommunications carriers (CTECs).⁶⁹ As noted in Section 3.1, the Iowa communications market is characterized by a large number of small providers, many of which are likely to meet HC eligibility requirements. These monies, however, have not been dispersed evenly across the state.

Table 12 summarizes estimates of broadband availability across rural and non-rural counties with varying degrees of geography served by providers eligible for HCL, ICLS, and LSS support. Eligibility for these programs is based on a number of factors including structural factors, such as low population density, and carrier-specific factors,

69 NBP, p. 141.

such as regulatory classification, as mentioned in the previous paragraph. Hence, mostly urban counties such as Polk have a low percentage of HC eligible providers. However, there are highly rural counties (such as Ringgold or Chickasaw) where there is low eligibility for these USF programs. Low eligibility for HC support program in those counties is likely due to carrier-specific factors and not structural factors such as population density and topography.

If the USF HC program is having a strong impact in the state, we would expect to see a correlation between service territory served by HC eligible providers and broadband availability, particularly in rural areas. Rural counties with low HC eligible service areas would present low broadband availability estimates, while rural counties with high HC eligible service areas would register relatively high availability estimates.

The Iowa Utilities Board (IUB) data do indicate that counties with larger degrees of territory served by HC eligible providers tend to have higher broadband penetration. Average broadband availability estimates in counties with less than 10% of their territory served by HC eligible providers is 87.17% of households, compared to 95.61% in counties with between 50 and 75% of territory served by these carriers, and 94.48% in counties with between 75 and 100% of their territory served by HC eligible providers.

Further, the availability gap between “HC eligible counties” and others is larger across rural counties.⁷⁰ On average 86.96% of households have broadband available in rural counties, with less than 10% of their territory being served by HC eligible providers. For rural counties with 50-75% of their territory served by these providers, average household availability is 95.40%. For rural counties where HC eligible carriers serve 75-100% of the territory, the average estimate is 94.85%.

Table 12 – Estimates of Broadband Availability Across Rural & Non-Rural Counties with Varying Degree of Geography Served by Providers Eligible for HCL, LSS and ICLS Support

	Percentage of County Territory Served by Providers Eligible for Support					
	Less than 10%	Between 10-20%	Between 20-50%	Between 50-75%	Between 75-100%	Total*
All Counties	87.17%	88.77%	94.08%	95.61%	94.48%	92.32%
Only Rural Counties	86.96%	86.74%	93.23%	95.40%	94.85%	91.84%
Only Urban & Suburban Counties	88.24%	92.56%	97.48%	97.21%	90.32%	94.2%
Number of Counties	12	23	35	17	12	99

This simple average county-level availability estimate is lower than the statewide estimate for broadband availability (95.36%) due to the fact that it does not weight county estimates by the underlying population in each county.

Source: For broadband availability rates, Connect Iowa, 2010. For USF eligibility, Iowa Utilities Board.

⁷⁰ Classification of rural and non-rural counties is based on the U.S. Census Bureau urban-rural classification based on Metropolitan Statistical Areas (MSAs), which are designated by the United States Office of Management and Budget to collect, tabulate, and publish federal statistics. Metropolitan statistical areas contain a core urban area with a population of 50,000 or more. According to Census Bureau county classification, counties are categorized as “urban” if they contain the core city of an MSA, “suburban” counties are MSA counties that do not contain a core city, and “rural” counties include all remaining counties that are not part of an MSA.

Figure 9 further reflects the relation between measured broadband availability and HC eligibility across counties. Among the 12 counties with less than 10% of territory served by carriers eligible for these three federal programs, three have estimated broadband availability rates greater than the state average: Polk County with 99.77% estimated availability; Buena Vista County with 98.57%; and Delaware County with 92.82%. Polk County is an urban county, home to the state capital of Des Moines, with high population density where high availability is predictable. Buena Vista County has a relatively high penetration of wireless, fixed broadband networks (with 94.57% of households served by these platforms, compared to 54.22% statewide).⁷¹ Similarly, Delaware County has a relatively high degree of wireless, fixed penetration, suggesting that lessons may be learned from the development of these wireless networks across these counties. While the data is inconclusive, it appears that market forces are able to provide relatively high broadband penetration in these two counties despite there being a small segment of the county eligible to receive benefits from the three USF HC programs under scrutiny.

Across the 23 counties with between 10% and 20% of territory served by HCL, ICLS, and LSS support, 15 are classified as rural. Availability estimates across these 15 counties are below the statewide average of 95.36% of households served. By contrast, of the 12 counties with 75% or more of territory served by HC-eligible carriers, 11 are classified as rural. Of these, seven have estimated broadband penetration above the state average of 95.36%.

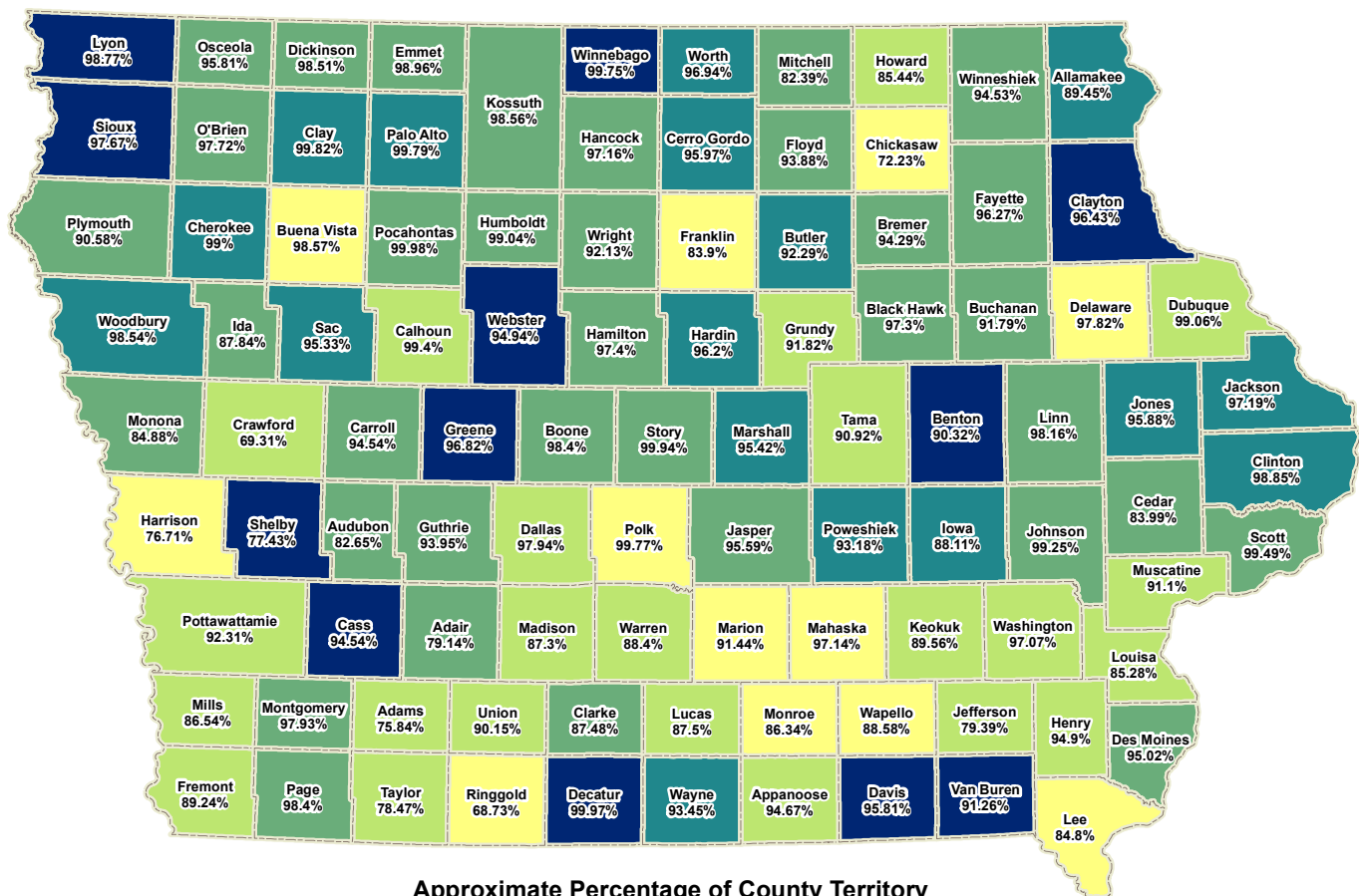
As mentioned above, the data analyzed in this section offers only a partial view of USF disbursements across the state. While not comprehensive, this assessment indicates that eligibility for the USF programs of HCL, LSS, and ICLS support partially explains broadband penetration measured across rural counties in Iowa.

⁷¹ See Table 10 in this report.

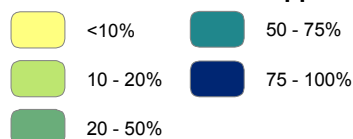
Figure 9

Broadband Availability in the State of Iowa Percentage of Households Served by Terrestrial, Non-Mobile Broadband Service

At Least 768 Kbps Download/200 Kbps Upload Speeds
USF Support by County



Approximate Percentage of County Territory
Served by Carriers Eligible for High Cost Loop (HCL),
Local Switching Support (LSS),
and Interstate Common Line Support (ICLS)



Following NBP recommendations for reform of the USF program, and the related Intercarrier Compensation rules, the FCC has now reopened several dockets to evaluate and propose reforms to USF programs and rules. Results from the partial High Cost USF data in Iowa suggest that USF disbursements are a relevant factor driving the expansion of broadband networks across rural areas in the state of Iowa. Hence, the FCC reforms underway are likely to have important policy implications across the state. Further examination of the impact of comprehensive USF disbursements across Iowa communities is recommended in order to assess the historical and ongoing impact of this federal program upon the broadband market in Iowa and evaluate the implications of proposed reforms.

Furthermore, as discussed in the following section, disbursement of USF funds is likely an important factor explaining the differences between Connect Iowa's estimates of broadband availability and the FCC's NBP simulation estimates (See Section 3.4 below). In order to obtain reliable broadband inventory estimates, it is recommended that the state of Iowa continue gathering and validating data under the SBDD grant program that can be used to ascertain the true extent of unserved and underserved areas in the state.

3.4 FCC and Connect Iowa Availability Estimates – A Comparative Analysis

As part of the National Broadband Plan, the FCC published in April 2010 a study titled "The Broadband Availability Gap," which includes research assessing the level of funding necessary to provide broadband to all those U.S. households that don't currently have service available.⁷² This estimate is constructed to ensure universal broadband service across the nation of at least 4 Mbps download and 1 Mbps upload speeds, the National Broadband Availability Target.⁷³ The study includes a simulation of the current state of broadband availability that estimates 123 million households, or 95% of the U.S. population, have "or will have in the near-term without government support" service supported at these speeds; while 7 million households, or 5% of the nation, do not.⁷⁴ It further estimates that the cost to serve these households at the National Broadband Availability Target capacity is \$23.5 billion.⁷⁵ This FCC simulation constitutes the only nationwide estimate of broadband inventory and sets the stage for the national debate over reform of the Universal Service Fund program. As such, it is an important benchmark in the public policy debate.

The FCC Availability Gap study includes simulated estimates of broadband inventory for each county across the nation. For the state of Iowa, these estimates are the result of a simulation based on commercially available data and data from other states. This section presents a comparative analysis between Connect Iowa's measured broadband inventory and the FCC simulation of broadband availability for the state of Iowa.

Connect Iowa has collected broadband inventory data by speed tiers as required by NTIA's SBDD NOFA.⁷⁶ This comparative analysis contrasts broadband inventory across Iowa of at least 3 Mbps download speeds (the closest NTIA defined speed tier to the FCC's National Broadband Availability Target) with the FCC simulation estimates of at least 4 Mbps download speeds.

The FCC's Availability Gap study estimates that 95% of U.S. households are currently served by broadband of at least 4 Mbps download and 1 Mbps upload speeds.⁷⁷ Connect Iowa estimates that in the spring of 2010, 87.60% of Iowan households are served by broadband of at least 3 Mbps download speeds.⁷⁸ This 7.4 percentage point

⁷² FCC Availability Gap.

⁷³ *Ibid.*, at footnote 3, 4.

⁷⁴ *Ibid.*, 17.

⁷⁵ *Ibid.*, 1.

⁷⁶ SBDD NOFA, Technical Appendix.

⁷⁷ *Ibid.*, 17.

⁷⁸ See Table 1.

difference between the FCC and Connect Iowa's estimates of broadband availability corresponds to approximately 85,000 households.

In order to better understand the nature of the discrepancy between the FCC simulation and Connect Iowa's estimated broadband availability, county-level data is examined, and the underlying assumptions of the FCC model are analyzed and compared against structural factors in the Iowa broadband market.

Table 13 reports FCC and Connect Iowa estimates of broadband availability by county.⁷⁹ The data is sorted according to density of population and showcases that the FCC and Connect Iowa estimates are relatively similar across urban counties.⁸⁰ By contrast, results from the two studies differ across rural counties, and in some cases the estimates are significantly different.⁸¹ While the average difference across the two studies' county-level estimates is 6.31 percentage points, the two estimates differ by as much as +47.36% in Fremont County, where Connect Iowa measured capacity is significantly below the FCC simulation. By contrast, in Davis County, Connect Iowa estimates availability at 95.15% compared to the FCC simulation of only 54%.

**Table 13 – Broadband Estimated Availability in the State Of Iowa By County:
FCC and Connect Iowa Estimates**

County	Household Density	Percent Households Served		
		FCC Gap Simulation (≥ 4 Mbps)	Connect Iowa Estimates (≥ 3Mbps)	Difference (= FCC-CI % Estimate)
Ringgold County	4.2	54	45.24	8.76
Adams County	4.4	58	50.89	7.11
Taylor County	5.3	69	62.5	6.5
Wayne County	5.4	65	61.31	3.69
Adair County	6.0	70	49.04	20.96
Monona County	6.1	72	81.02	-9.02
Audubon County	6.3	63	63.43	-0.43
Fremont County	6.3	78	30.64	47.36
Pocahontas County	6.3	70	99.45	-29.45
Decatur County	6.3	77	99.86	-22.86
Davis County	6.4	54	95.15	-41.15
Van Buren County	6.6	59	64.92	-5.92

⁷⁹ FCC county availability gap simulation estimates are available at <http://www.broadband.gov/maps/availability.htm>.

⁸⁰ With the exclusion of Muscatine County.

⁸¹ Correlation estimates between density of population and the gap between FCC and Connect Iowa estimates is 0.29, indicating that as density of population decreases, the divergence across the two study estimates is larger.

		Percent Households Served		
County	Household Density	FCC Gap Simulation (≥ 4 Mbps)	Connect Iowa Estimates (≥ 3Mbps)	Difference (= FCC-CI % Estimate)
Osceola County	7.0	76	31.63	44.37
Kossuth County	7.2	75	91.74	-16.74
Palo Alto County	7.3	84	97.06	-13.06
Greene County	7.4	80	76.33	3.67
Ida County	7.4	74	56.96	17.04
Monroe County	7.4	89	63.57	25.43
Franklin County	7.5	79	54.3	24.7
Lyon County	7.5	75	47.57	27.43
Guthrie County	7.9	70	50.33	19.67
Calhoun County	7.9	81	99.06	-18.06
Keokuk County	7.9	81	38.25	42.75
Worth County	8.2	58	82.93	-24.93
Sac County	8.2	75	62.65	12.35
Clarke County	8.3	97	77.83	19.17
Howard County	8.4	82	65.77	16.23
Hancock County	8.4	81	85.65	-4.65
Shelby County	8.8	77	70.83	6.17
Harrison County	8.8	85	59.44	25.56
Lucas County	8.9	72	61.85	10.15
Allamakee County	8.9	93	89.26	3.74
Crawford County	9.0	70	52.53	17.47
Mitchell County	9.2	87	39.8	47.2
Cherokee County	9.3	86	70.92	15.08
Clayton County	9.5	71	95.18	-24.18
Madison County	9.5	85	77.98	7.02
Tama County	9.7	92	78	14
Humboldt County	9.9	77	90.06	-13.06

		Percent Households Served		
County	Household Density	FCC Gap Simulation (≥ 4 Mbps)	Connect Iowa Estimates (≥ 3Mbps)	Difference (= FCC-CI % Estimate)
Grundy County	9.9	86	83.43	2.57
Wright County	10.2	90	76.26	13.74
Chickasaw County	10.3	75	61.37	13.63
O'Brien County	10.5	89	77.16	11.84
Iowa County	10.5	85	75.97	9.03
Butler County	10.6	89	59.31	29.69
Cass County	10.8	80	64.66	15.34
Plymouth County	10.9	86	72.97	13.03
Winneshek County	11.2	83	93.54	-10.54
Louisa County	11.2	91	64.12	26.88
Emmet County	11.2	100	98.57	1.43
Montgomery County	11.5	87	82.49	4.51
Hamilton County	11.6	86	97.2	-11.2
Appanoose County	11.6	76	64.8	11.2
Delaware County	11.8	83	87.99	-4.99
Winnebago County	11.9	86	99.75	-13.75
Fayette County	12.0	83	90.13	-7.13
Mills County	12.2	81	64.19	16.81
Cedar County	12.3	78	59.83	18.17
Union County	12.4	84	84.6	-0.6
Page County	12.5	84	82.79	1.21
Poweshiek County	12.6	78	53.06	24.94
Jackson County	12.7	73	88.13	-15.13
Clay County	12.8	88	99.7	-11.7
Buena Vista County	13.0	88	91.78	-3.78
Jones County	13.1	94	93.6	0.4
Hardin County	13.4	83	94.06	-11.06

		Percent Households Served		
County	Household Density	FCC Gap Simulation (≥ 4 Mbps)	Connect Iowa Estimates (≥ 3Mbps)	Difference (= FCC-CI % Estimate)
Benton County	13.6	92	63.51	28.49
Floyd County	13.6	93	52.6	40.4
Buchanan County	13.9	81	85.2	-4.2
Sioux County	13.9	96	81.32	14.68
Washington County	14.2	89	83.88	5.12
Carroll County	14.9	88	85.9	2.1
Jefferson County	15.3	86	69.08	16.92
Mahaska County	15.6	93	71.29	21.71
Henry County	17.6	90	87.46	2.54
Boone County	18.2	94	98.16	-4.16
Dickinson County	18.6	100	93.75	6.25
Jasper County	20.1	93	85.2	7.8
Bremer County	20.2	93	92.68	0.32
Marion County	21.7	94	83.79	10.21
Webster County	22.2	98	94.66	3.34
Warren County	25.7	93	81.98	11.02
Dallas County	26.6	97	95.32	1.68
Marshall County	26.8	88	94.24	-6.24
Clinton County	28.9	92	90.22	1.78
Lee County	29.3	96	77.31	18.69
Cerro Gordo County	34.1	97	88.15	8.85
Wapello County	34.2	89	82.26	6.74
Pottawattamie County	35.5	95	85.86	9.14
Muscatine County	36.1	99	76.55	22.45
Des Moines County	41.5	95	92.7	2.3
Woodbury County	44.9	96	96.72	-0.72
Story County	51.3	98	99.88	-1.88

County	Household Density	Percent Households Served		
		FCC Gap Simulation (≥ 4 Mbps)	Connect Iowa Estimates (≥ 3Mbps)	Difference (= FCC-CI % Estimate)
Dubuque County	55.4	94	98.07	-4.07
Johnson County	71.7	98	97.34	0.66
Black Hawk County	87.6	98	96.56	1.44
Linn County	107.0	99	95.32	3.68
Scott County	136.1	100	97.41	2.59
Polk County	261.9	100	99.42	0.58
STATE TOTAL	20.6	95%	87.6%	7.4%

Source: Household Numbers and Density: Census Bureau, 2000. FCC Availability Gap. Broadband Availability Estimates: Connect Iowa, May 2010.

What appears to be driving these differences?

The FCC Availability Gap study is based on limited data available from commercial sources and a handful of states. This limited data is used to simulate broadband inventory across other states where, as in the case of Iowa, robust broadband inventory did not exist in April 2010. Furthermore, the FCC Availability Gap simulation is based on a series of assumptions of national broadband market trends that are not necessarily applicable to the broadband market in the state of Iowa. These discrepancies likely explain the measured differences between the FCC and Connect Iowa estimates across rural areas in the state.

The FCC Availability Gap simulation estimates national cable penetration based on cable penetration data from commercially available data and publicly available data from the commonwealth of Massachusetts.⁸² Wireless network coverage is estimated using a commercial dataset from American Roamer. However, due to lack of reliable sources for Wireless ISP (WISP) provider data, this type of platform is not included in the FCC analysis.⁸³ National estimates of DSL (or telco) penetration are based on data from the states of California, Minnesota, Pennsylvania, Alabama, and Wyoming.⁸⁴ For all other states, the FCC Availability Gap analysis estimates broadband penetration using statistical simulation modeling.

According to the FCC Availability Gap analysis, “the main risk in this approach is the possibility of systematic differences between the states for which we have data and the states for which we do not. Since the statistical regression relies on a small number of states, to the extent that the tie between demographics and network availability in the rest of the country is not the same as these states, the regression will not be accurate. The states we used in our analysis have a wide variety of rural and urban areas and have varied geographic challenges which are advantageous, but there is no way to verify our outputs without additional data.”⁸⁵

⁸² FCC Broadband Availability Gap, p. 21.

⁸³ Ibid, p. 25.

⁸⁴ Ibid, p. 23.

⁸⁵ Ibid, p. 24.

Data and analysis in this report suggest that the state of Iowa is an outlier in the broadband market, characterized by atypical structural factors that likely drive the gap between FCC and Connect Iowa broadband availability estimates, including:

- Unserved areas in Iowa have relatively low density of population. The average population density of populated Census Blocks in the United States is 153.6 people per square mile. FCC estimated “unserved” Census Blocks have a much lower density, with an average of only 13.8 people per square mile.⁸⁶ By contrast, the average population density across Iowa is 52.4 and the average household density is 20.6.⁸⁷ Connect Iowa estimates that the average household density across unserved Census Blocks in Iowa is 3.66 for all Census Blocks, and 4.19 across all Census Blocks where there is population;⁸⁸
- Relative to other states, there is low penetration of cable in Iowa with an estimated 34 cable providers serving collectively 842,000 homes, or 73.30% of all Iowan households.⁸⁹ Such low penetration of cable is consistent with the rural nature of the state and the fact that cable networks tend to be present in urban and suburban areas but less so in rural areas;
- Iowa has a high penetration of wireless fixed networks (WISPs) with an estimated 47 WISPs serving collectively 623,000 homes, or 54.22% of all Iowan homes;⁹⁰ and
- Iowa has the largest number of DSL providers of any state in the U.S. Connect Iowa’s spring 2010 broadband inventory includes data from 117 DSL providers collectively serving just under a million homes or 86.64% of all Iowa households.⁹¹

Because of the large number and small size of telecommunications operators in the state, it is likely that a relatively high percentage of households across Iowa are served by rate-of-return DSL providers, as opposed to Regional Bell Operating Companies (RBOCs) or mid-size price-cap carriers. This has important implications for eligibility under the Universal Service Fund program, which currently is based upon the regulatory framework that applies to each provider. Small rate-of-return carriers, in particular, are more likely to benefit from the High Cost program.⁹² The broadband inventory across the state of Iowa is significantly impacted by USF High Cost program funding. It is unclear from the FCC Availability Gap report whether the FCC’s simulation includes USF funding as a factor driving the broadband inventory simulation across the nation. Omission of such factors may explain the discrepancies across the two studies, particularly in rural states with a large number of small providers, like Iowa.

The broadband market in the state of Iowa presents unique structural factors that collectively amount to important differences between Iowa and the states of Massachusetts, Minnesota, California, Alabama, Wyoming, or Pennsylvania, upon which the FCC relies to formulate its broadband inventory analysis. These structural differences are likely driving the discrepancies between the Connect Iowa broadband inventory and the FCC Availability Gap simulation for the state of Iowa. It is important to continue gathering and validating broadband inventory and adoption data in the state of Iowa – particularly in rural areas – in order to accurately measure the broadband gaps and demand across the state and inform the ongoing Universal Service Fund reform debate currently underway at the FCC.

⁸⁶ Ibid, p. 19.

⁸⁷ U.S. Census Bureau, 2000.

⁸⁸ See Table 6 in this report.

⁸⁹ Ibid.

⁹⁰ Ibid.

⁹¹ See Table 5 in this report.

⁹² NBP, p. 141 and USF NOI, footnote 7.

3.5 Connectivity Across Community Anchor Institutions in the State of Iowa

Connect Iowa has identified the names and addresses of 4,936 Community Anchor Institutions (CAIs) across the state of Iowa, including 901 libraries, 1,872 K-12 schools, 77 institutions of higher education, 1,246 public safety facilities (including fire departments, state and local police, and sheriff's offices), 167 healthcare institutions (such as hospitals and medical clinics), and 673 other state, local, and federal government facilities. Of these identified CAIs, Connect Iowa has gathered partial broadband connectivity data (such as broadband platform, download speed, or upload speed) from 1,470 institutions, or 30% of all identified CAIs, including: for 832 (or 92%) of identified Iowa libraries, 129 (or 7%) of K-12 schools, 30 (or 39%) of higher education institutions, 88 (or 7%) of public safety facilities, 34 (or 20%) of healthcare facilities, and 357 (or 53%) of other identified government institutions across the state. Within these categories, Connect Iowa has collected full connectivity data (broadband platform, download speed, *and* upload speed) for 612 institutions (or 12% of the identified CAIs).

Table 14 summarizes data from CAIs that have submitted information regarding the type of platform serving their broadband needs. The broadband platform cited by the largest share of Community Anchor Institutions is optical carrier/fiber broadband, cited by 23% of institutions that indicated their broadband platform. Only 4% of CAIs that knew their broadband platform use DOCSIS cable service, whereas 19.6% use "other" cable modem service. Twenty-nine percent of CAIs that knew their broadband platform reported using DSL service (17.1% reported using asymmetric DSL, and 11.9% use symmetric DSL), while 13.9% said they rely on other copper wireline service, 2.2% have satellite service, and 8.4% use wireless service (0.5% uses terrestrial unlicensed fixed wireless, 7.8% uses terrestrial licensed fixed wireless, and 0.1% relies on terrestrial mobile wireless service).

Table 14 – Broadband Technology Platform Among Subset CAIs that Report Broadband Platform Data

Technology Platform	Percent of CAIs Served by Platform (among those who knew their broadband platform)
Asymmetric DSL	17.1%
Symmetric DSL	11.9%
Other Copper Wireline	13.9%
Cable Modem-DOCSIS	4.0%
Cable Modem-Other	19.6%
Optical Carrier/Fiber	23.3%
Satellite	2.2%
Terrestrial Fixed Wireless-Unlicensed	0.5%
Terrestrial Fixed Wireless-Licensed	7.8%
Terrestrial Mobile Wireless	0.1%

Source: Connect Iowa, May 2010.

Among those CAIs that reported their service download speeds, the largest share of CAIs subscribe to service between 1.5 Mbps and 3.0 Mbps (22.9%), followed by those that subscribe to broadband service with an advertised download speed between 3.0 Mbps and 6.0 Mbps (17.3%). Among these CAIs that know their advertised down-

load speeds, 13.9% reported that they consider their service to be “broadband” have download speeds below 768 Kbps. While these data are suggestive of the type of broadband subscriptions by CAIs across the state of Iowa, the data should be interpreted cautiously. As noted, these broadband connectivity data represents only 12% of the identified CAIs across Iowa, a percentage too low to be representative of the current state of CAI connectivity in the state. Because of the policy implications of these connectivity data, it is important to continue the SBDD data collection effort to build a more complete dataset.

Appendix A

Connect Iowa Residential Technology Assessment

June 2010